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THE TREATMENT OF PATIENTS INFESTED WITH *TÆNIA SAGINATA*, WITH SPECIAL REFERENCE TO CERTAIN UNUSUAL RESULTS.

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MUCH of this paper is based on the personal observations made during the treatment of 86 cases of *Tænia saginata* infestation.

Of the three large tapeworms found infesting man, *Tænia saginata* is considered by many authorities to be the most difficult to expel.⁽¹⁾ This is probably true, but if care be taken, 90% of cures can be expected from the first treatment, when this is carried out in hospital. However, a successful result from one treatment cannot be guaranteed in any individual case, as occasionally, for some unknown reason, failure occurs. Treatment should

be undertaken only after an unequivocal diagnosis has been made by the physician actually seeing the ripe segments of the worm. Every person harbouring one or more mature *Tænia saginata* passes *per rectum* almost daily several ripe segments of the worm. Details of the diagnosis, with accompanying photographs, were given in an earlier report.⁽²⁾

GENERAL PRINCIPLES OF TREATMENT.

The aim of the treatment is to empty the food residuum out of the intestine and then to administer an effective quantity of an anthelmintic in one dose or in divided doses within a short period of time. The anthelmintic, after killing or paralysing the tapeworm, must be immediately expelled from the intestine, together with the tapeworm, by the aid of a suitable purgative. It is essential that the head should be paralysed or killed in order that a cure may be effected. When single worms only are harboured there are no degrees of success; the

patients are either cured or not cured. These general principles have been appreciated by clinicians for a great number of years.

SUMMARY OF TREATMENT WITH LIQUID EXTRACT OF MALE FERN.

Treatment of Adults: Three Periods.

Before discussing the details of any portion of the treatment a routine method suitable for adult patients will be outlined. The whole course of treatment can be divided into three periods, as follows.

1. *Period of Preparation.*—On the first day the patient, unless constipated, is allowed an ordinary diet for breakfast and a light midday meal. The evening meal should be fluid, consisting only of beef tea, sweetened fruit juices, water, tea, coffee or cocoa. The bowels should be opened twice during this day. This is usually brought about by administering 30 cubic centimetres (one ounce) of Epsom salt in the morning. In cases of obstinate constipation a soap and water enema should be given, followed by four to eight cubic centimetres (one to two drachms) of *Pulvis Jalapæ Compositus* by mouth, and the anthelmintic treatment should not be started until the bowels have been well evacuated.

On the first evening the patient should be brought into hospital. If the bowels have not been opened at least twice during the day, administer an enema and a draught of the following purgative mixture A:

Magnesi Sulphatis, 15.0 grammes (half an ounce).

Tinctura Jalapæ, 6.0 cubic centimetres (one and a half drachms).

Tinctura Chloroformi Composita, 1.2 cubic centimetres (20 minims).

Aquam, ad 30.0 cubic centimetres (one ounce).

If the bowels have been well opened twice, no further purgation is required before the anthelmintic is administered on the morning of the second day. All patients should be encouraged to drink fluids.

2. *Period of Anthelmintic Medication.*—On the second morning no food or fluid apart from that necessary in treatment should be given to the patient, who should be kept in bed.

At 8 a.m. administer six gelatin capsules, each containing 0.9 cubic centimetre (fifteen minims) of fresh liquid extract of male fern. It is advisable to procure the male fern extract direct from the wholesaler, as that stocked by retail pharmacists is frequently years old. (If the patient is not in good general health or is less than 66.2 kilograms or ten and a half stone in weight, the number of capsules should be reduced accordingly. Details of dosage will be given later.) The minimum quantity of water or sweetened orange juice, sufficient to allow easy swallowing of the capsules, should be given. Because of eructations, the offensive flavour of the male fern may produce vomiting. After the capsules have been administered it is advisable, therefore, to give barley sugar to suck, and to provide orange

drink so that the patient may take a few mouthfuls if there is any tendency to vomit.

At 9 a.m. administer another six capsules, each containing 0.9 cubic centimetre (fifteen minims) of liquid extract of male fern. (Note: This dose of male fern is larger than that recommended by most authorities. It should not be exceeded, nor should it be given to out-patients, and if vomiting occurs it should not be repeated.)

3. *Period of Post-Anthelmintic Purgation.*—At 11 a.m. administer two "Seidlitz powders". At 12 noon, if the complete worm has not been obtained, give a soap and water enema. If the result is not satisfactory, one draught, or more in constipated cases, of the Epsom salt and tincture of jalap mixture should be administered. If necessary, this should be followed one hour later by a second enema, but no further bowel treatment should be given, even if, as occasionally happens, the worm has not been expelled. After the bowels have opened at least twice following the administration of the anthelmintic, the patient should be given frequent small non-fatty meals of readily digestible food and allowed to go home the same evening, if his or her condition permits. The majority of patients are little affected by the treatment, and many feel quite ready to go home as soon as the worm is obtained. Some, however, feel that the purgation and the semi-starvation are rather weakening.

Examination of the Stools.

After administration of the liquid extract of male fern the stools should be passed into a bedpan lined with surgical gauze dyed black. This method of receiving the stools should be continued for the first four motions, unless the head has been obtained earlier, as is usually the case. The faecal material is washed through the gauze with cold water, the clean worm being left behind. Sometimes there is an excessive amount of mucus in the stool, and this must be carefully examined, as it may easily conceal the head. Magath and Brown,⁽³⁾ at the Mayo Clinic, used a wire sieve (20 mesh to the inch) instead of the black gauze. The sieve would undoubtedly be more serviceable, but for occasional cases it might not be convenient to procure.

Usually the complete worm with head is obtained four hours after the first dose of liquid extract of male fern. Sometimes, however, a large portion of the worm may be passed at this time, but the head may not be expelled for a further one to three hours. On three occasions the first motion after the administration of the male fern contained the head and a few ripe segments, whereas the bulk of the worm was not passed until some time later.

After washing, the whole of the contents of the gauze should be placed in a large glass beaker containing water. On close examination it will be easy to recognize the bulbous pigmented head attached to a thin narrow neck, usually about one millimetre in its wider diameter. The head invariably sinks to the bottom of the beaker, where it can easily be seen by looking from below. If the

water in the beaker be cloudy, repeated washing of the worm with water, followed by careful decantation of the supernatant fluid after allowing the worm to settle, is desirable to permit of its close examination. If the head is not found, the gauze and toilet paper should be examined closely. The greatest diameter of the head usually measures 1.5 millimetres. It has a flattened anterior aspect bearing four hemispherical suckers just visible to the naked eye. Its exact appearance when dead can be accurately appreciated by the examination of Figure I. The amount of black pigment in the head varies considerably from specimen to specimen, some being jet black and other rarer forms being only slightly pigmented.

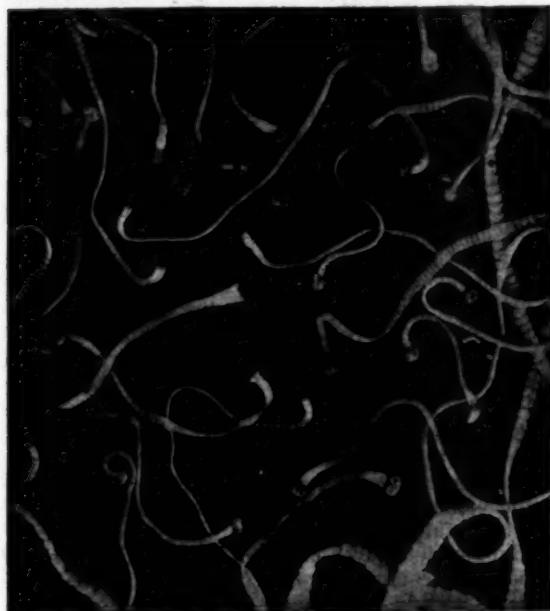


FIGURE I.

The heads and anterior portions of twenty-seven *Taninia saginata* obtained from one patient, twenty-six of them at the first treatment. (x2.)

In almost all cases of infestation, whether single or multiple, it can confidently be asserted that the major portions of all the worms present will be expelled, provided the recommended total dose of an active male fern extract has been administered and not vomited. The four exceptions to this rule have occurred in patients who have actually been cured, although only detached ripe segments of the worm had been expelled in three cases, and the head and detached ripe segments in the fourth. The case histories are given later. Usually, by close examination of the macroscopic morphology, the exact number of worms present can easily be ascertained. This close examination is specially necessary when one or more of the worms are passed in several pieces. The only case in which we were unable to determine the number of worms present was one from which we obtained

twenty-six heads on the first treatment. Subsequently five other heads were shown to have remained. In the majority of cases of multiple infestation, however, only two to six worms are present, and no difficulty in determining the number is usually experienced.

It follows from the above statement that before any immediate assurance of cure can be given, the number of heads found must correspond with the number of worms present. It is unusual to encounter multiple infestation in persons who have lived in Victoria all their lives. Only two cases were found amongst forty-eight persons treated.⁽⁴⁾

In our experience, the worm is usually passed in two pieces, in addition to several detached ripe segments; the anterior piece, to which the head is attached, varies from 1.25 centimetres (half an inch) to several feet in length; it is often 7.5 to 10.0 centimetres (three to four inches) long. If, however, it is only 1.25 centimetres (half an inch) long, it is inconspicuous, and occasionally some difficulty is experienced in discovering it. Close examination of the contents of the gauze after removal of the main portion of the worm is therefore essential. Even when all the above details are attended to, a patient may be cured although the head or heads may not be found. We have had numerous examples of this; in fact, most of the patients from whom we have not recovered the complete number of heads have subsequently proved to be cured. From one patient one head only was discovered amongst the major portions of five worms obtained after treatment, but no segments were passed by the patient for six consecutive months, which proved beyond doubt that she was cured. In this particular case five motions passed after the administration of the male fern were carefully examined. When the complete number of heads is not found, we certainly do not recommend a second treatment in a week or ten days' time, as is recommended in some text-books. Most of these patients, after receiving the doses we give, are already cured.

To our knowledge, retention of the head associated with the cure of the patient has not been recorded when the results of treatment of groups of cases have been published. Apparently the patients have not been traced and proved to be cured, or, when they have, the loss of heads has been attributed to the carelessness of an assistant. As we have always supervised or undertaken the search for heads, we must take the responsibility if they have been lost, as probably they have on some occasions. However, in several instances the faeces passed during the two days following treatment of persons who have subsequently been proved to have been cured, have been carefully but unsuccessfully searched for the number of heads corresponding with the number of worms present. The heads in these cases were very probably retained and digested. If almost complete but apparently killed worms can fail to be expelled by drastic purgation, as we have noticed in four cases and previously mentioned (see case histories), it is not unreasonable to expect that heads attached to small seg-

mented portions of worms are not uncommonly left in the intestine and digested.

In our experience, the worm is usually broken during treatment and expelled in two pieces in addition to the detached ripe segments. Osler⁽⁶⁾ and others recommend that the stools should be passed into warm water to prevent violent contractions of the worm, which occur if an active worm is stimulated by cold objects. This violent contraction is considered to break the worm and allow some of it to be retained. When small doses of male fern are administered this may occur, but with the dose we use tapeworms are usually expelled motionless (apparently dead) or at the most only feebly active. We are of the opinion that the peristaltic actions of the intestine fail to expel a live tapeworm, not only because of the attachment of the head to the mucosa of the small intestine, but mainly because of the active movements of the parasite in a forward direction against the intestinal stream. By the use of very strong purgatives only a small percentage of live worms will break and so allow the discharge of a long length of worm. We cannot conceive that the delicate neck of a worm would fail to be broken if the remainder of the worm were inactive during vigorous peristalsis. During treatment, when the worm is expelled in two pieces, the main portion of the worm probably loses its powers of active contraction and so becomes a dead weight before the head is detached from the mucosa of the small intestine. A big strain is therefore thrown on the thin and weak anterior portion of the worm, with its consequent breakage.

Evidence of Cure.

An immediate assurance of cure can be given if the number of heads obtained corresponds with the number of worms harboured.

At a later date a patient, from whom the number of heads corresponding to the worms present was not found, can definitely be stated to be cured if segments do not appear for one hundred consecutive days. (Very rare exceptions to this rule may be found, but we have not encountered any.)

Probable Causes of Failure to Cure.

Assuming that a usually adequate dose of an active extract of male fern has been administered, the following causes may lead to failure:

1. A portion of the male fern extract may be vomited. This is the main disadvantage of the treatment, especially when the extract is given by mouth in mixture form. Vomiting is unusual when it is administered in gelatin capsules. The vomitus, if substantial in quantity, should be readministered through a stomach tube or the treatment should be postponed for some days. It is not advisable to give a full dose to replace the one of which an unknown portion has been vomited. Toxic symptoms may follow from such a procedure.

2. Food taken just prior to or soon after the administration of the male fern extract. The active principle of the male fern is probably diluted too much or absorbed by the food material.

In a small percentage of patients receiving their first treatment, failure to cure occurs when no probable explanation can be found.

DETAILED DISCUSSION OF THE TREATMENT WITH LIQUID EXTRACT OF MALE FERN OF ADULTS SUFFERING FROM SAGINATA TENIASIS.

Period of Preparation (Semi-Starvation and Purgation).

The period of preparation, which is laid down as half a day in the summary just given, should be lengthened for constipated patients. For others, who are not constipated, it may be shortened so that the patient misses breakfast on the morning of treatment only. On the day preceding that on which the anthelmintic is administered the bowels should be opened twice, by means of purgatives and enemata if necessary. The type and dose of purgative required for an effective evacuation of the bowel varies considerably in different individuals. A half drachm of *Pulvis Jalapæ Compositus* is sufficient for some patients, whereas two drachms are necessary for others. Before administration of a purgative to very constipated patients the large bowel should be emptied by means of an enema or, if necessary, a high colonic douche.

Any of the common purgatives are suitable, but it is considered advisable by most authorities not to give any oils (for example, castor oil) immediately preceding or following the administration of liquid extract of male fern. Oils are supposed to increase the absorption of the drug and therefore to increase the liability to toxic symptoms.

The purgation should not be so strong and prolonged that an excessive production of intestinal mucus occurs from irritation. This preparatory period should be sufficiently long to empty the intestine fairly well before the anthelmintic is administered. Nevertheless it should be as short as possible, compatible with fulfilling its function. Patients should be warned against starving themselves for long periods before treatment in the hope that by starving the worm a cure will be more certain. We have found that long starvation does not increase the efficiency of treatment. Some patients, however, insist on starving themselves excessively and present themselves for treatment in a weakened and irritable condition. It is important during this period of preparation to assess the irritability of the intestine to the purgatives used. This is necessary so that evacuation of the contents of the whole intestine may be promptly brought about at a suitable time after the administration of the anthelmintic. It is usually more satisfactory in dealing with adults to inquire directly from the patients, rather than from the nurse, regarding the number of motions.

Period of Anthelmintic Medication.

According to the majority of helminthologists, the anthelmintic of choice at the present time is liquid extract of male fern. A "fresh" active extract must be used (for details see the United States

Dispensatory, 1926). Of six different batches that we have obtained from three different wholesalers, all have been quite satisfactory. We have successfully used material that we have had for three to six months. It was reputed by the wholesalers to have been imported one to two months before we obtained it. That supplied by retail pharmacies may be fresh, but it may be many years old. To our knowledge we have not used any old material, and are therefore not in a position to say how fresh the extract should be, but extracts over one year old are not considered reliable. Male fern extract should be thoroughly stirred before being dispensed. We have used liquid extract of male fern exclusively because the results that we and others have obtained have been at least as good as, if not much better than, those claimed by workers using different drugs. In addition, toxic symptoms from the doses we recommend, except very occasionally slight giddiness, have not occurred in our hands. Treatment by carbon tetrachloride, which is also reputed to be very efficient, is described later.

On the other hand, liquid extract of male fern has an offensive nauseating taste, which cannot be effectively hidden, to our knowledge, by any flavouring agent. If administered in such a way that the patient fully tastes the drug, it is fairly frequently vomited. When the vomitus is substantial in amount it should be readministered through a stomach tube or failure to cure is likely to occur.

The patient should be put to bed after the administration of the anthelmintic, because, according to the literature, giddiness and syncope may be produced by it. Only two of our eighty-six patients experienced giddiness after the administration of the extract of male fern. In neither case was it severe. Several patients complained of giddiness during the preparatory stage of the treatment, but this was probably due to the starvation.

Administration Within a Short Period of Time.

The total dose of liquid extract of male fern to be administered may be conveniently divided into two or more doses and given so that the interval between the first and last dose is not more than one hour. Smaller repeated doses day after day are usually of no avail. A patient of 56.7 kilograms (nine stone) recently came to our notice, who had been treated with 3.5 cubic centimetres (one drachm) of liquid extract of male fern three times a day for seven days, 74.6 cubic centimetres (twenty-one drachms) in all being administered. This succeeded in setting up an entero-colitis and making the patient feel generally miserable, but had no effect in expelling even a portion of the worm. It is very surprising that serious toxic symptoms were not produced. Subsequently the patient was cured on our first attempt by the administration of 8.8 cubic centimetres (two and a half drachms) within one hour. In all probability, if the total amount to be administered were given in one dose, the results would be just as good as those obtained when it is divided into two doses given at an hour's interval.

We have treated a number of patients with only one dose and have noticed no difference in the results.

Dosage.

In the summary of the treatment of adults we recommend a total dose of 10.7 cubic centimetres (three drachms) of liquid extract of male fern. This dose we regard as safe for all adults in good general health, when in hospital under competent medical supervision. Nevertheless it is, as a rule, unnecessarily large for patients of small weight. Regulation of the dose according to body weight is sufficiently accurate for practical purposes (see Table I).

TABLE I

Weight.	Total Dose. ¹ (British Pharmacopoeia, 1932. 25% Filicin.)
Over 66 kilograms (10.5 stone).	10.7 cubic centimetres (3 drachms).
56.5 to 66 kilograms (9 to 10.5 stone).	8.8 cubic centimetres (2.5 drachms).
44 to 56.5 kilograms (7 to 9 stone).	7.1 cubic centimetres (2 drachms).

Reduce to three-quarters if the patient is to be treated as an out-patient.

We should like to advise physicians not to exceed the doses we recommend, because serious toxic symptoms might occur and the percentage of cures cannot be greatly increased. The maximum dose used by most authorities varies between 5.3 and 8.8 cubic centimetres (one and a half and two and a half drachms). Magath and Brown⁽⁶⁾ in each of nineteen cases employed a total dose of 6.0 cubic centimetres (approximately 1 drachm 41 minims). They were of the opinion that it was an adequate dose, and stated that "if the following course of treatment be rigidly adhered to, one may expect success in practically every instance". We can hardly agree with this statement on the evidence they gave. They treated nineteen patients. One to four heads were obtained by their first treatment from each of ten patients, but, as already pointed out, this does not prove that the patients were cured. Heads were not discovered from the remaining nine patients because of either vomiting or errors in procedure, attributed to either the patient or the nurse. These workers apparently did not follow up their patients to see whether segments reappeared, nor did they mention having made any efforts to decide the number of worms harboured by each patient. A careful analysis of the data they record does not give any precise information as to the percentage of success following their treatment.

The United States Pharmacopoeia at that time required its oleoresin of male fern to contain 24% filicin, that is, approximately the same as the extract employed by us. However, there is no unanimity amongst workers regarding the active principle of male fern, so that the present method of standardization may not be the best, as there are two important factors to be considered: first, the toxicity and, secondly, the therapeutic activity. We have been informed that in parts of India 14.2

cubic centimetres (four drachms) are used and that the drug is standardized for toxicity by the use of guinea-pigs. Deaths have been reported following the administration of doses of 14.2 and 21.3 cubic centimetres (four and six drachms),⁽⁷⁾ but no details regarding these cases have been available to us. Although we recommend large doses, we know of adults who have been cured with only 3.55 cubic centimetres (one drachm) of the extract, usually after several treatments. Our doses may be unnecessarily large, but we have tested them in a moderately large number of cases and have shown that they do not cause toxic symptoms under our conditions of use and that they give the best results obtained by the exhibition of this drug. Patients who had been treated before coming to our notice and who had been at least adequately starved before and purged after the administration of the male fern extract, had frequently received doses of 3.55 to 5.3 cubic centimetres (one to one and a half drachms). Some of the patients had been treated several times without a cure being effected.

Methods of Administration.

The following are the methods of administration of liquid extract of male fern or its "active principle" which are available to the physician. Any one of these methods may be necessary in a particular case.

(A) *Administration by Mouth.*—When the drug is given by mouth several methods may be used, as follow.

1. The drug may be given in emulsion, for example:

Extracti Filicis Liquidum, 5.3 cubic centimetres (one and a half drachms).

Mucilaginis Tragacanthæ, 5.3 cubic centimetres (one and a half drachms).

Extracti Glycyrrhizæ Liquidum, 3.5 cubic centimetres (one drachm).

Glycerini, 3.5 cubic centimetres (one drachm).

Spiritti Anisi, 0.3 cubic centimetre (five minims).

Aquæ Chloroformi, ad 30.0 cubic centimetres (one ounce).

or

Extracti Filicis Liquidum, 5.3 cubic centimetres (one and a half drachms).

Mucilaginis Tragacanthæ, 5.3 cubic centimetres (one and a half drachms).

Syrupi Zingiberis, 3.5 cubic centimetres (one drachm).

Aquæ Chloroformi, ad 30.0 cubic centimetres (one ounce).

Any mixture containing *Extractum Filicis Liquidum* is so nauseating that at least one in ten patients vomits. However, after we had given up this method of administration as a routine, we had to employ it for an adult foreigner who could not speak English and who would not swallow capsules or the stomach tube. The patient did not vomit and a cure was effected.

2. The drug may be given in gelatin capsules. The capacity of the capsules should be 0.9 cubic centimetre (fifteen minims) for adults and 0.35 cubic centimetre (six minims) for children. The number of capsules administered depends on the total dosage required. These are often administered at ten-minute intervals, but so long as the interval

between the first and last capsule is not longer than one hour, other variations are probably of no importance. For no adequate reason this capsule method of administration is not used very much. However, we have found it very effective and much more pleasant for the patient than any of the other methods. Some authorities include in the capsules calomel in a total dose of 0.77 gramme (twelve grains) for adults.

3. The drug may be given in keratin-coated capsules. These capsules pass through the stomach before their contents are liberated. If we could guarantee that they would open almost immediately on entering the small intestine, they would theoretically be ideal. However, it is quite possible that they may actually pass the site of attachment of the head of the worm before their contents are liberated. We have not used these capsules.

4. The drug may be given in the form of "Palatinoid Filmaron". This is a proprietary preparation containing the active principle of male fern dissolved in castor oil. The dose recommended by the manufacturers is three "Palatinoids", followed one hour later by castor oil. The efficiency of the preparation is disputed by some clinicians.

(B) *Administration by the Stomach Tube.*—The stomach tube, to be comfortable for the patient, should be made of moderately soft rubber with a rounded perforated end, and should measure approximately four millimetres in external diameter and two millimetres in internal diameter. After the sensations experienced during the swallowing of the tube were explained to the patients, we had no difficulty in getting them to swallow it. The passage of the tube is much facilitated by drinking water during the process. This water and any stomach contents are aspirated through the tube before the liquid extract of male fern is injected.

The liquid extract of male fern is conveniently injected either undiluted or in the form of the same emulsion as recommended for oral administration. The tube is emptied by injecting a little air, and is washed out while in the lower portion of the oesophagus with 7.1 cubic centimetres (two drachms) of orange juice. It should be left *in situ* for one hour, the interval between the first and second or last dose. After the total dose has been injected, and while the patient is breathing deeply through the mouth, the tube is removed carefully. Thirty cubic centimetres (one ounce) of sweetened orange juice are given immediately. This covers effectively the taste of the minute amounts of liquid extract of male fern which are sometimes brought up into the mouth when the tube is being withdrawn.

This tube method is highly satisfactory, because, strange as it may seem, vomiting very rarely occurs in its use, but if it does the vomitus containing the extract can be reinjected without the knowledge of the patient. It is not advisable to repeat a dose after portion of one has been vomited, because the exact amount retained cannot be accurately estimated. The gelatin capsule method, however,

gives equally good results and therefore the use of the stomach tube is rarely justified. On one occasion an adult patient could not swallow gelatin capsules and yet little difficulty was experienced in the passage of the thin stomach tube.

(C) *Administration by Duodenal Tube.*—The duodenal tube is passed by the Lyons method into the duodenum and the liquid extract of male fern, in an emulsified form, is injected. Theoretically this method would seem to be the best, as the extract is passed without delay or dilution in the stomach, close to the region of the small intestine, where the head is actually attached. This method has been found by some parasitologists to be highly effective.⁽⁸⁾ We, however, have obtained as good results without its use, and as it is a tedious method (taking two hours on the average for the passage of the tube), we consider that it is unnecessary for ordinary purposes unless other methods, after a fair trial, have failed. This has not happened hitherto in our hands.

(D) *Administration by Nasal Tube Passed Through the Nose into the Lower Part of the Oesophagus or into the Stomach.*—Giving the drug by the nasal tube passed through the nose into the lower part of the oesophagus or into the stomach is without doubt the best in the case of young children who will not swallow 0.35 cubic centimetre (six minims) gelatin capsules. A thin urinary rubber catheter, measuring four millimetres in external diameter, should be used for the purpose. With the arms placed straight down by the sides, the child should be wrapped in a blanket. The tip of the catheter, lubricated with liquid paraffin, is passed along the floor of the larger nasal cavity. When it reaches the posterior pharyngeal wall it is pushed on another 5.0 centimetres (two inches) and then the child's head is fully extended while the catheter is advanced a further five centimetres. This extended position of the head prevents the catheter entering the trachea. With the head in a comfortable position the catheter is further advanced until it is well down into the oesophagus. After satisfying oneself that the tube is in the oesophagus and not in the trachea, the total dose of the anthelmintic is injected. The tube is emptied by injecting 10 cubic centimetres of air, is washed out with 7.1 cubic centimetres (two drachms) of sweetened orange juice, and then withdrawn. The child is immediately given 14.2 cubic centimetres (half an ounce) of sweetened orange juice by mouth and put to bed. The unpleasant part of this method, from the commencement of the passage of the tube until its withdrawal, does not last more than one to two minutes. We have used this method in children and there is no difficulty in getting the process started after explaining its value in childish terms. Crying and screaming invariably soon begin, but usually stop quickly with the promise to remove the tube. A little bribery in the form of chocolate to be eaten after treatment soon reestablishes a friendly relationship between the child and the doctor.

(E) *Administration by the Duodenal Tube through the Nose.*—Giving the drug by the duodenal tube through the nose has been used by Karger⁽⁹⁾ at the children's clinic, Berlin University, in the case of patients who have vomited the drug. Details of the procedure were not discussed in the literature available to us. However, we should imagine that, if the process of passing the duodenal tube were as long as that required for the Lyons method, it would be very exhausting for the child, owing to the excitement. A local anaesthetic applied to the nasal cavity would facilitate the use of this method.

Period of Post-Anthelmintic Purgation.

After the anthelmintic has had sufficient time to kill or paralyse the worm, the object is to remove both the anthelmintic and the worm as quickly as possible; in the case of the former to prevent unnecessary toxic absorption, and in the case of the latter to prevent a paralysed worm from overcoming the effects of the male fern and reestablishing itself in the intestine.

Two hours after the last dose of anthelmintic, that is, three hours after the first dose, a suitable purgative is administered in a dose that will open the bowels within one to two hours, making allowance for the purgative action of the male fern. The approximate dose of purgative required is determined for each individual patient during the period of semi-starvation and purgation. Usually we have used two "Seidlitz powders". Occasionally, however, one or more draughts, each containing 5.3 cubic centimetres (one and a half drachms) of *Tinctura Jalapæ* and 21.3 grammes (three-quarters of an ounce) of Epsom salt, have been employed. As previously mentioned, it is inadvisable to use castor oil at this stage. It is unfortunate to administer an ineffective purgative, as it is important to get the bowels open within two hours after giving a purgative by mouth. However, even large doses of purgatives have occasionally failed in some of our cases. Evacuations by means of enemata are helpful and should be employed for moving on the whole of the intestinal content, but it is not sufficient just to move it on; the whole of it should be moved out.

It must not be thought, because of the precautions described above, that the dose of male fern recommended is a very dangerous one. To our knowledge no deaths have ever been reported from the doses we recommend.

After the bowels have opened effectively the patient is given frequently small quantities of easily digested food and allowed to go home the same day.

THE TREATMENT OF CHILDREN.

The treatment of children is essentially the same as that of adults. A period of half to one day of semi-starvation and purgation is usually necessary. The administration of the liquid extract of male fern is the main difficulty, because of its objectionable taste, no matter how flavoured. Children almost invariably refuse to take it. When they do take it, vomiting frequently follows. An attempt

should be made to get older children, of about six to ten years, to swallow 0.35 cubic centimetre (six minims) gelatin capsules. After a little practice on empty capsules this is usually successful; but, if not, the nasal tube should be used as already described.

The dosage is set out in Table II.

TABLE II.

Age in Years.	Weight not Less Than.	Total Dose of Extract of Male Fern. ¹ (British Pharmacopoeia, 1932.)
5	15.75 kilograms (2.5 stone).	3.5 cubic centimetres (1 drachm).
10	33.25 kilograms (4.5 stone).	5.3 cubic centimetres (1.5 drachms).
15	44.0 kilograms (7.0 stone).	7.1 cubic centimetres (2 drachms).

Reduce to three-quarters if patient is to be treated as an out-patient.

We have never been called upon to treat children under three and a half years of age or those weighing less than 15.75 kilograms (two and a half stone). In Victoria *Tania saginata* infestation in young children must be extremely rare. We have obtained evidence from Syria showing that the children there are frequently infested at three to four years of age. In that country the eating of raw beef commences at a very early age.

One of our patients, while living in Syria, acquired *Tania saginata* infestation when one and a half years old. After having tapeworm for two years she came to our notice and was in the best of health and very well nourished. At three and a half years she weighed 16.75 kilograms (two stone nine pounds) and showed no toxic symptoms after a total dose of 3.5 cubic centimetres (one drachm), which removed two complete worms.

A case is reported in which the patient was first treated at the age of two years and three months.⁽¹⁰⁾ He was treated four times before being cured at the age of two years and eight months, each time receiving 1.2 grammes (20 grains) of oleoresin of aspidium, which are approximately equal to 1.2 cubic centimetres (20 minims) of *Extractum Filicis Liquidum*.

TOXIC SIGNS AND SYMPTOMS ARISING FROM THE ADMINISTRATION OF EXCESSIVE QUANTITIES OF LIQUID EXTRACT OF MALE FERN.

The toxic signs and symptoms that may arise from the administration of excessive quantities of liquid extract of male fern are as follow: giddiness and cramps; severe gastro-intestinal symptoms; stupidity and staring gaze; severe pain and tenderness in the epigastrium; rapid, feeble pulse; cyanosis; dyspnoea, accompanied by agonizing precordial pain, sometimes radiating up into the neck region; clonic and/or tonic spasms; marked albuminuria; hæmolytic jaundice; temporary disturbances of vision; complete blindness in consequence of total optic atrophy; loss of consciousness; paralysis of the breathing centre; death.

We are indebted to a German colleague⁽¹¹⁾ for the majority of the above signs and symptoms. Toxic symptoms were not infrequent years ago. Nagel,⁽¹²⁾ in 1903, reported two cases of amaurosis and optic

atrophy following the administration of ten grammes of *Extractum Filicis Liquidum*, which, according to the assay, was practically the same as that used here at the present time. Meyer⁽¹³⁾ (1905) described a patient who, twelve hours after receiving "the usual dose" of *Extractum Filicis Liquidum*, exhibited unconsciousness, preceded by vertigo and headache. On recovery the patient was almost completely blind. One fundus showed optic atrophy and the other venous stasis and optic neuritis. Meyer quoted four similar cases that had been reported by Studt. Denham⁽¹⁴⁾ quotes the history of an adult patient who "collapsed and fell into coma" ten minutes after receiving 5.3 cubic centimetres (one and a half drachms) of *Extractum Filicis Liquidum*. She remained stuporose for two hours, but completely recovered. She had been in the habit of taking a dose of olive oil each night. The amount absorbed in ten minutes from a dose of 5.3 cubic centimetres (one and a half drachms) must be extremely small. We do not wish to be dogmatic about this case, but consider than an explanation other than idiosyncrasy might very well account for it. We have not met with idiosyncrasy in any of our cases. We must bear in mind that when untoward results follow a particular treatment there is commonly a tendency on the part of the responsible person to understate the amount of a toxic drug given.

Prophylaxis of Toxic Symptoms.

1. Never order doses larger than those that we have recommended. Deaths have been reported apparently in adults with doses stated to be 14.2 and 21.3 cubic centimetres (four and six drachms) respectively.

2. If vomiting occurs after a dose of male fern, do not repeat the dose on the assumption that the whole of the first was vomited. Re administer the vomitus containing the male fern by the stomach or nasal tube, or postpone treatment for several days.

3. Unless the doctor is personally administering the medicine, it is advisable to have only the required amount dispensed. Mark the prescription: "Not to be repeated", that is, do not allow anyone else to have the opportunity to give an overdose.

4. Have the alimentary canal as empty as possible before giving the drug. It should not be administered with or soon after any oil, for example, *Oleum Ricini*, because this is said by many authors to increase its absorption.

5. Do not allow the liquid extract of male fern to remain in the intestine for longer than four to five hours. Administer an effective dose of purgative three hours after the first dose of male fern.

6. If the head is not found after treatment, do not repeat the treatment immediately. Wait until segments reappear in the stools.

Treatment of Toxic Symptoms.

There is no known antidote. On the first suspicion of toxic symptoms, excluding giddiness and vomiting, (i) wash out the stomach and bowels and administer a strong purgative with ample water,

(ii) inject morphine if the dyspnoea or pain becomes severe, (iii) stimulants may be required in severe cases.

ALTERNATIVE DRUGS USED TO EXPEL *TÆNIA SAGINATA*.

Although we have used liquid extract of male fern exclusively, there are many other drugs that have been employed.

Carbon Tetrachloride (CCl₄).

In spite of the statements in the majority of helminthological text-books that carbon tetrachloride is valueless against tapeworms, it has recently been used with much success by a small number of clinicians.^{(12) (16)} The total dose of the drug recommended by most authorities for adults is 2.6 to 3.4 cubic centimetres (45 to 60 minims), administered in two equal doses of 1.3 to 1.8 cubic centimetres (22 to 30 minims), with half an hour's interval between them. On the published evidence this does not appear to be as safe as liquid extract of male fern, and therefore we cannot recommend its use (see fatal results). It is administered in the morning and followed two hours later by a purgative dose of Epsom salt. Occasionally oil of chenopodium in a total dose of 0.9 cubic centimetre (fifteen minims) is combined with the carbon tetrachloride.

Methods of Administration.—Carbon tetrachloride may be given: (i) in gelatin capsules; (ii) in sugar (the dose required is placed in a tablespoon and covered with sugar, then swallowed quickly); (iii) in twenty times its volume of syrup of gum.

Toxic Symptoms.—Toxic symptoms include dull headache, nausea, drowsiness, tetany and jaundice, the latter usually becoming apparent to the naked eye two days after the administration of the drug. There is a delayed action like that of chloroform on the liver.

Fatal Results of Treatment.—It has been stated by Clayton-Lane⁽¹⁷⁾ that death may occur from 1.5 cubic centimetres. Apparently great apprehension has been caused. The drug has been used extensively for the treatment of hookworm with the fatal results shown in Table III.

TABLE III.

Total Dose.	Number of Cases.	Number of Deaths.
3 cubic centimetres (never exceeded).	6,000.	4 (Kouwenar). ⁽¹²⁾
5 cubic centimetres (+1.5 cubic centimetres of oil of chenopodium).	15,000.	5 (Kehrer and Oudendal). ⁽¹²⁾
3 to 4 cubic centimetres.	Over 20,000.	3 (Lambert). ⁽¹²⁾

Prevention of Toxic Symptoms.—Too large a dose should not be given. The maximum safe dose is disputed. Only chemically pure carbon tetrachloride must be used. Some commercial samples contain toxic impurities. It should not be given to alcoholics nor to those with heart, liver or kidney disease. Its administration should be preceded by a carbohydrate diet. It should be followed two to

three hours after its administration by an effective purgative.

Treatment of Toxic Symptoms.—Calcium chloride or ammonium chloride is said to control the symptoms (Stitt).⁽²¹⁾ A carbohydrate diet, free fluids and purgation are also advisable.

Pumpkin Seed.

Pumpkin seed is recommended by some authorities as the "best" treatment of tapeworm infestation in children. The whole seed is mixed into a paste with honey or syrup, or pounded up with sugar.

Total Dose.—The total dose recommended is as follows: 30 to 50 grammes of the seeds for children of five to seven years, 60 to 120 grammes of the seeds for children of ten to twelve years.

The total dose is given at once and is followed one hour later by a purgative. One of our patients had been treated on two occasions by this method with the dose stated above without even expelling portion of the worm. There was a ready response to treatment with liquid extract of male fern.

Pelletierin Tannate.

Pelletierin tannate should not be used for children, and with a dose of 0.26 gramme (four grains) is successful in only 35% of adults.⁽²²⁾ It is usually given in a dose of 0.26 gramme (four grains). Toxic symptoms occur occasionally. Its use cannot be recommended.

Other Drugs.

Thymol, kamala, turpentine, infusion of cusso, coconut, chloroform and salol have their advocates, but the published results cannot compare with those obtained with male fern or carbon tetrachloride.

RESULTS OF TREATMENT.

Eighty-five of eighty-six patients harbouring a total of 186 *Tænia saginata* are known to have been cured by us of their infestations. Approximately the first third of the patients treated had a preparatory period of two to three days' semi-starvation and purgation, irrespective of whether or not they were constipated, and all the adults were given three drachms of *Extractum Filicis Liquidum* by mouth without consideration of their weight. The remaining two-thirds of the patients were treated essentially according to the recommendations that have been made in this paper. Of the 86 patients, 77 were cured with only one treatment (see "Evidence of Cure"), eight were cured after a second treatment, and one patient, from whom we obtained twenty-six heads at the first treatment and one at the second, may need further treatment, as the heads of four other worms harboured were not found.

Children.

Of the 86 patients, 10 were children. Table IV gives the relevant data concerning these patients. It will be noticed that all except one of the ten children required only one treatment in order to

TABLE IV.
Details of the Treatment of Ten Children Infected with *Tenias Saginata*.

No. of Case.	Age in Years.	Weight.	Duration of Infestation.	Duration of Starvation (Pre-treatment Period) in days.	Preparatory.		Total Dose of <i>Exst. Filicis Liq.</i>	Method of Administration of <i>Exst. Filicis Liq.</i>	Post-Antelmintic.		Final Result.	Remarks.
					Bowel Treatment	Number Bowel Actions.			Bowel Treatment.	Immediate Results.		
1	9	26.7 Kg. (58.5 lb.)	3 weeks.	0.5	15.0 gm. (0.5 oz.) Mag. Sulph.	2	5.3 c.cm. (1.5 dr.) (divided).	Gelatin capsules (6 mins.).	One Scidlitz. Enema. One Scidlitz.	One body, no head.	Segments re-appeared 90 days later. Cured by second treatment.	Vomited twice after capsules. No reaction to Castor and hyaline complement fixation tests. Second treatment same as first.
2	7.5	25.2 Kg. (55.5 lb.)	4 years.	0.5	15.0 gm. (0.5 oz.) Mag. Sulph.	2	4.4 c.cm. (1.25 dr.) (divided).	Gelatin capsules.	One Scidlitz. Enema.	One complete worm.	Cured.	
3	11	33.0 Kg. (72.7 lb.)	7 years.	1	Enema. 5.3 c.cm. (1.5 dr.) Tr. (0.5 oz.) 15.0 gm. (0.5 oz.) Mag. Sulph.	3	5.3 c.cm. (1.5 dr.) (divided).	Gelatin capsules.	Two Scidlitz. Enema.	Three bodies, one head.	Cured. 120 days free from segments.	
4	5	"	1.5 years.	1	"	"	3.5 c.cm. (1 dr.) (single).	Mixture.	One Scidlitz. Enema. 15.0 gm. (0.5 oz.) Mag. Sulph.	One complete worm.	Cured.	
5	4.5	15.7 Kg. (34.5 lb.)	3 weeks.	2.5	Dried fruits and enema.	3	3.5 c.cm. (1 dr.) (single).	Nasal tube.	One Scidlitz. Enema. 10.7 c.cm. (3 dr.) Sod. Sulph. 1.8 c.cm. (0.5 dr.) Pulv. Japal. Co. 15.0 gm. (0.5 oz.) Mag. Sulph. 3.5 c.cm. (1 dr.) Tr. Japal. Enema.	Bowel open only following enema. Only ripe segments obtained. Majority of worm retained.	Cured. (Ten months' freedom from segments.)	Very slight vomiting soon after <i>Exst. Filicis Liq.</i> Latex after post-antelmintic bowel treatment. (See Case History No. 1.)
6	5	17.3 Kg. (38.1 lb.)	9 months.	1	"	"	3.5 c.cm. (1 dr.) (single).	Mixture. Immediate pro-vomiting. Full dose repeated.	One Scidlitz. Enema.	One complete worm.	Cured.	Although no toxic effects followed repetition of this treatment, <i>Exst. Filicis Liq.</i> was not repeatable. To wait for several days would have been safer.
7	4	"	1 year.	1	"	"	3.5 c.cm. (1 dr.) (single).	Mixture. Vomited profusely. Full dose repeated, being cured.	One Scidlitz. Enema.	Head and ripe segments soon after enema. Body passed the following day.	Cured.	No toxic symptoms, but the procedure of repeating the <i>Exst. Filicis Liq.</i> is inadvisable.
8	7	18.0 Kg. (39.6 lb.)	4 years.	0.5	15.0 gm. (0.5 oz.) Mag. Sulph.	2	3.5 c.cm. (1 dr.) (single).	Nasal tube.	One Scidlitz. Enema.	One complete worm.	Cured.	Before coming to us she was treated four times in hospital without success, apparently because of vomiting.
9	6	"	2 years.	1	15.0 gm. (0.5 oz.) Mag. Sulph.	3	3.5 c.cm. (1 dr.) (single).	Gelatin capsules. Vomited 1.5 hours later. No repetition of dose.	One Scidlitz. Enema.	Body, but no head.	Cured. (119 days free.)	
10	3.5	15.7 Kg. (34.5 lb.)	2 years.	2	15.0 gm. (0.5 oz.) Mag. Sulph. Enema.	3	3.5 c.cm. (1 dr.) (single).	Nasal tube.	One Scidlitz. Enema.	Two bodies, one head.	Cured. (Nine months free.)	The two worms obtained were a dark grey, instead of the usual white or cream colour.

* Information not recorded, although it was obtained at the time of treatment.

be cured. The patient, Case X, attended for treatment at the beginning of the investigation and before we used the intranasal method of introducing the liquid extract of male fern. She was a Syrian, could not be prevented from screaming continuously for twenty-four hours before we attempted to commence treatment, and could not be persuaded to take the male fern in mixture form. No other method of administration was attempted at this time. At a later date the intranasal method of administration was successfully employed.

We were surprised that several young children could be persuaded to swallow 0.35 cubic centimetre (six minim) gelatin capsules. A little practice on empty capsules before beginning treatment was of value to get their confidence. If they start on filled capsules and, as a result of biting or sucking them, they taste the male fern, they are not very willing to cooperate further. Three patients who could not or would not swallow capsules were treated by the nasal tube.

The dose of male fern that we have used in the treatment of children has not been greater than that recommended by most workers, but, in addition to adequacy of dosage, the method of administration is a very important factor in children.

Adults.

Of the 76 adult patients, 68 were cured at the first attempt. A brief history of each of the eight adults who were not cured by the first treatment is given below.

CASE A.—A male Syrian, aged twenty-six years, weight 69.3 kilograms (eleven stone), had been infested for twenty years. He was very constipated. At the first treatment he was starved and purged for three days; 10.7 cubic centimetres (three drachms) of *Extractum Filicis Liquidum* were given in divided doses in mixture form. Four heads and five bodies were passed and segments reappeared two months later. The treatment was repeated exactly as on the previous occasion. One complete worm was obtained. Cure was confirmed twelve months later.

CASE B.—A male Syrian, aged fifty-eight years, weight 66.1 kilograms (ten and a half stone), had been infested for over fifty years. He was very constipated. At the first treatment he was starved and purged for one and a half days. He was given 10.7 cubic centimetres (three drachms) of *Extractum Filicis Liquidum* in divided doses in mixture form. Twenty-six heads were obtained. Major portions of the worms were too tangled and broken to be counted, but only two contained ripe segments. The others were short and not completely grown. Segments reappeared six weeks later. At the second treatment one day's starvation was given, the bowels were opened only once; 10.7 cubic centimetres (three drachms) of *Extractum Filicis Liquidum* were given in gelatin capsules. Purgatives and enemata failed to secure satisfactory evacuation of the gut, though a delayed constipated stool contained one head and five bodies. The final result is not yet known. The period of preparation was probably insufficient.

CASE C.—A female Syrian, aged twenty-nine years, had been infested for twenty-five years. Her weight was 69.3 kilograms (eleven stone). She was constipated. At the first treatment two days' semi-starvation and purgation were given. Purgatives were ineffective. The bowels were opened only with enemata. She was given 10.7 cubic centimetres (three drachms) of *Extractum Filicis Liquidum* in mixture form. Vomiting occurred. Three

"Seldlitz powders" were given without effect; an enema gave a poor result. Tincture of jalap, 7.1 cubic centimetres (two drachms), and Epsom salt, 30 grammes (one ounce), were then administered, followed one hour later by a second enema. The bowels were opened well after this enema. The motion contained three bodies and two heads. Segments reappeared ninety days later. At the second treatment 10.7 cubic centimetres (three drachms) of *Extractum Filicis Liquidum* in gelatin capsules were given. One body but no head was passed; but the patient was cured, as no segments were passed during the following nine months.

CASE D.—A female Australian, aged fifteen years, weight 66.1 kilograms (ten and a half stone), had been infested for one year; she was very constipated. At the first treatment three days' starvation and purgation were followed by 7.1 cubic centimetres (two drachms) of *Extractum Filicis Liquidum* in divided doses. The body of a worm was obtained, but no head. Segments reappeared seventy-seven days later. At the second treatment three days' starvation and purgation were followed by the administration of 10.7 cubic centimetres (three drachms) of *Extractum Filicis Liquidum*. A complete worm was obtained. Cure was confirmed after four months.

CASE E.—A female Australian, aged twenty-two years, weight 50.4 kilograms (eight stone), had been infested for three years. She was very excited and hysterical. At the first treatment, after two and a half days' starvation, the patient spat out the male fern mixture and refused further treatment, even with capsules. At the second treatment, after one day's semi-starvation, the patient would not swallow capsules, but she was more reasonable than at the first treatment, and after persuasion submitted to the passage of the stomach tube, which was accomplished without difficulty. Seven cubic centimetres (two drachms) of undiluted *Extractum Filicis Liquidum* were injected in a single dose and the tube was immediately withdrawn. One complete worm was obtained without delay. Cure was confirmed six months later.

CASES F, G, and H.—The patients were males. They were not constipated. There were each given 10.7 cubic centimetres (three drachms) of liquid extract of male fern after apparently adequate preparation. No vomiting occurred. Only the "bodies" of their single worms were obtained. Segments reappeared within three months. Second treatments were carried out exactly the same as the first treatments, but the patients were all cured. The heads were obtained in two cases (F and G). In Case H the head was not obtained, but the patient was free from the passage of segments for the succeeding nine months.

Remarks on Cases A to H and Case I of Table IV (cases requiring two treatments).—In Cases A, B and C the patients each harboured three or more worms. They were all markedly constipated, and in Case C the patient vomited. However, in the series there were 21 cases of multiple infestation, so that three failures out of 21 does not suggest that multiple infestation greatly lessens the chance of cure, especially when we consider that the uncured patients were constipated and one vomited portion of the male fern. When a very large number of worms is harboured, for example, 31 (Case B), it would be reasonable to suppose that the chance of cure is greatly reduced. Excluding this case, the average number of worms harboured by the other patients with multiple infestation was four and a half.

In Case D the patient probably received too small a dose, and in Case E the patient had no chance of being cured, as practically no liquid extract of male fern was swallowed.

In Case I (see Table IV) the patient vomited twice after the male fern was given, but as the portion of the worm obtained was motionless and included the very thin anterior portion, it was expected that the patient might be cured.

In the remaining three cases (F, G and H) the patients exhibited no features that one might reasonably expect would tend to produce the unsuccessful results.

We see from these cases that although vomiting of the anthelmintic, constipation and heavy infestations may play a part in producing unsuccessful results, there is in addition an adverse element which we have not determined.

Summary of Results.

The combined results of the treatment of both children and adults were 77 cures in 86 cases treated by us for the first time, that is, approximately 90% success at the first attempt. Eight of the nine patients treated a second time were cured, while the result in the remaining case is doubtful. We have, therefore, no reason to suppose that when the drug fails on the first occasion it is because the worm is unduly resistant to it, for, if this were so, the percentage of successes on the second treatment would be much less than on the first treatment, which we have not found to be the case. This suggests that changing the anthelmintic, if the first treatment is not successful, is not warranted.

Case Histories of Four Patients who were Cured by Liquid Extract of Male Fern, but from whom the Major Portions of the Worms were not Expelled.

The following are the case histories of four patients who were cured by liquid extract of male fern, but from whom the major portions of the worms were not expelled.

CASE I (see Case V of Table IV).—After the administration of the liquid extract of male fern the purgatives used were ineffective, but the bowels were opened three times by enemata while the patient was in hospital. As a result of the first enema several typical ripe segments of the worm were obtained and the strong odour of the anthelmintic was noticeable, as usual. The subsequent enemata produced only a little fecal-stained mucus having the same odour. Ten hours after the administration of the liquid extract of male fern the child was taken home, and every motion for the succeeding seven days was passed into a pan and examined by a very intelligent and painstaking mother, but no worm was seen. Almost all the motions for the next ten months were examined, but no segments reappeared. During the first two weeks after leaving hospital the child was less active than usual and a little irritable, but otherwise well.

Apparently this child harboured a fully grown *Tania saginata*, which, although not expelled, was killed as a result of the treatment given and subsequently digested.

CASE II.—A male Syrian, aged twenty-one years, whose weight was 56.7 kilograms (nine stone), had been infested for fifteen years. He was semi-starved and purged, contrary to our orders, for three days before coming to hospital. Eight cubic centimetres (two drachms) of *Extractum Filicis Liquidum* were given in gelatin capsules. The purgatives administered after the anthelmintic were two "Seidlitz powders", 5.3 cubic centimetres (one and a half drachms) of tincture of jalap, 30 grammes (one

ounce) of Epsom salt, and 5.3 cubic centimetres (one and a half drachms) of *Pulvis Jalapa Compositus*. In addition, three soap and water enemata were given. In all, the bowels were opened seven times. Four ripe segments were found in the motion following the first enema. Other stools, especially the later stools, consisted mainly of mucus. The last stool had streaks of blood.

This patient was one of the few Syrians who was really anxious to get rid of his tapeworm, after a fifteen-year friendly partnership. He had not been treated before, but was about to be married to a partner who did not harbour a tapeworm. Because of the interest he therefore displayed, we believe, as he assured us, that he carefully examined the motions after leaving hospital. A second incentive was the five pounds reward which he would have received for the tapeworm had he produced it. No segments were passed during the six months following treatment. This we take to be another example of retention of the tapeworm, followed by its digestion, and associated with cure of the patient. The severe purgation he received was a mistake in treatment; after the bowels had been opened two to three times nothing further should have been done. However, he was none the worse for his experience.

CASE III.—A male Australian, aged forty years, suffered from cerebral syphilis and was a diabetic and an alcoholic. The duration of his infestation was unknown. He was treated with 8.0 cubic centimetres (two and a quarter drachms) of *Extractum Filicis Liquidum*. His bowels were opened several times. Only ripe segments were expelled; the remainder of the worm was retained. This patient was kept in a private hospital for the diabetic and syphilitic conditions, and all his stools were examined carefully for several weeks. No segments were passed during the following four months.

CASE IV.—A female Australian, aged thirty-four years, whose weight was 53.7 kilograms (nine and a quarter stone), had been infested for six years. She was given 8.8 cubic centimetres (two and a half drachms) of *Extractum Filicis Liquidum*, followed later by two "Seidlitz powders", enema, 30.0 grammes (one ounce) of Epsom salt and 3.5 cubic centimetres (one drachm) of tincture of jalap. The head, attached to one inch of the anterior portion of the worm, and a few ripe segments were obtained. The major portion of the parasite was not expelled at any time during the following week, nor were any segments passed during the succeeding three and a half months.

Cases I to IV are examples of failure during treatment to expel the major portions of *Tania saginata*, associated with cure of the patients. To our knowledge, this phenomenon has not been reported in cases of *Tania saginata* infestation.

In Cases I to III the complete worms, excluding detached ripe segments, were retained. In Case IV the head and ripe segments were expelled and the body was retained. There was probably a fifth case of this nature, but as we obtained no ripe segments during treatment it is possible that the patient had a spontaneous cure a few days before entering hospital.

We are satisfied that these retained worms must be digested. We must assume that the male fern had either immediately killed them or injured them so much that they subsequently died. One of the patients (Case IV) purged herself, against orders,

every day for one week after treatment without expelling the parasite. To explain why the purgation does not expel a dead parasite is difficult. Many *Tæniæ saginata* are in a marked state of contraction after being killed by *Extractum Filicis Liquidum*. The suckers on the head may sometimes contract so firmly on the mucosa of the small intestine that the worm is anchored while rapid digestion takes place. This appears an explanation for Cases I to III, but it is at variance with our hypothesis that a live worm is held in the intestine not only by the anchoring head, but mainly by the active movements of the main portion of the worm in a forward direction against the intestinal stream. If the head of a worm permanently releases its grip on the mucosa, it is difficult to understand why it must not be expelled. We have not encountered any mummies of *Tæniæ saginata* as described by Leuckart and others.

After considering these cases it is not difficult to imagine that the head only may be retained and the patient be cured. How many cases of this nature we have encountered we cannot accurately estimate, as the head may have been lost on many occasions. Of the 182 (probably 183 to 186) worms which we eradicated from 86 patients (excluding the results of the first treatments in the nine cases requiring two treatments), 31 heads from 17 patients were either retained or lost. In all these cases the stools passed during the first ten hours (and in some instances much longer) following the administration of the anthelmintic were examined. We feel fairly certain that a proportion of these heads was retained.

The lessons we have learned from these cases of retained complete worms or worm heads are:

1. Do not over-purge the patient in the post-anthelmintic period. If the male fern can be smelt in two motions, no further purgation is necessary. Worms may appear in subsequent stools, but it is probably advisable to allow them to pass normally or to assist them with enemata.

2. If the head of the worm is not found, do not repeat the treatment until segments reappear, even if great care has been taken to examine for the head all the stools passed during ten or even forty-eight hours immediately following the administration of the anthelmintic. However, when a large portion of the extract of male fern is vomited and the portion of worm obtained is actively motile, it may be permissible to repeat the treatment without waiting for segments to appear. We have never treated a patient a second time before segments reappeared, because the portion of the worm discharged by the first treatment was actively motile, and on a small number of occasions we have been surprised to find patients cured although they had passed, after vomiting, only actively motile worms without heads.

Three Cases in which the Head was Expelled before the Major Portion of the Worm.

There were three cases in which the head was expelled before the major portion of the worm. One

patient was Case VII of Table IV, and the other two were female adults. The head in every instance was obtained almost exactly four hours after the first dose of male fern. In Case VII the major portion of the worm was passed fourteen hours later, and in the female patients one and two hours later respectively. These cases show the necessity for examining for heads every stool passed after the male fern has been given, even those passed before the main portion of the worm is expelled.

Patients Cured after the Administration of Anæsthetics.

Patients cured after the administration of anæsthetics are not included in the eighty-six to whom we have previously referred.

CASE V.—A female patient, English, aged forty-two years, was infested for twenty years. She was treated by two doctors and many pharmacists, approximately sixty times in all, usually with liquid extract of male fern, but the doses administered are not known to us. The patient had given up hope of ever being cured when she underwent an operation for prolapse of the uterus. She noticed segments until the day of operation, four years ago, but she has never passed a segment since, and therefore was cured apparently by the anæsthetic. The anæsthetic employed was ethyl chloride for the induction, followed by ether given by the open method. In all, the operation lasted a little over one hour. Neither the nurse nor the patient noticed the tapeworm in the stools passed immediately after operation, but no special examination was made for it.

We are indebted to Dr. W. I. Hayes for the details of the anæsthetic employed.

CASE VI.—A female Australian, aged forty years, first noticed her infestation when she vomited several ripe segments of *Tæniæ saginata* immediately following anæsthetization by ethyl chloride and ether for the extraction of teeth. The patient examined her stools without finding any segments during the following four weeks. She then underwent a cholecystectomy. At operation gall-stones were found in the gall-bladder. The anæsthetic administered was again ethyl chloride for the induction, followed by ether given by the open method. The operation lasted approximately one hour. During the following four years no segments were found in the stools or on the underclothing.

Which of the two operations was followed by cure of the patient we cannot say, but as there were no segments for one month after the first operation, when only a few ripe segments were vomited, it is probable that the worm was killed then. We are indebted to Dr. Lucy Bryce for making the diagnosis and supplying us with the name and address of this patient in addition to several others.

In Cases V and VI the patients were cured apparently by either the ethyl chloride or the ether, or both. In all probability the ethyl chloride was the curative agent. As no long portion of worm was seen by either patient, the worms were either passed unnoticed or retained and digested.

Only two other patients out of one hundred with whom we have made contact received anæsthetics for surgical operations while they were infested with tapeworm. These two patients were not cured of their infestations. One patient suffered from appendicitis with abscess, and the other from appendicitis and at a later date incomplete abortion.

Both patients were operated on in Syria and the details of the anaesthetics administered have not been obtained. It is regrettable that the anaesthetics employed during labour were not recorded in our cases, but several of the patients were probably submitted to short anaesthetics, which did not rid them of their infestations.

A Case of Spontaneous Cure.

CASE VII.—A female patient, English, aged forty-three years, had an infestation the duration of which was unknown. The patient first noticed the infestation when she passed about ten feet of the worm for no apparent reason. Two months later she passed spontaneously another long length of worm, but during the intervening period no segments had been found in the stools or on the underclothing. During the following four years no segments were passed. The diet of the patient was quite simple and no medicines had been taken.

A satisfactory explanation for this very rare, apparently spontaneous cure cannot be given.

There is little or no evidence that acquired or age immunity resulting in cure of patients is developed against *Tenia saginata* infestation. However, there is evidence that animals develop immunity to tapeworm infestation. Australian sheep probably develop some such immunity, as adult tapeworms are found much more frequently in lambs than in sheep. Further, Turner, Berberian and Dennis⁽²⁸⁾ claim to have successfully artificially immunized dogs against infestation with *Tenia echinococcus*.

CONCLUSIONS.

1. By the use of large but safe doses of liquid extract of male fern approximately 90% of cases of *Tenia saginata* infestation can be cured by one treatment. The treatment is simple, but it must be carried out with care, since, as with practically all anthelmintics, the effective therapeutic dose is not much less than the toxic dose.

2. A few patients fail to be cured by the first treatment for no apparent reason.

3. Practically no patients require more than two treatments with *Extractum Filicis Liquidum* before a cure is effected.

4. The main factors for successful treatment are adequate preparation of the patient and the administration of an adequate dose of an active extract of male fern in such a manner that the chance of vomiting is reduced to a minimum.

5. To prevent the toxic effects of liquid extract of male fern, which may be fatal, do not give an overdose and make certain that the bowels are well evacuated four to five hours after administering the anthelmintic.

6. In almost all cases of infestation, whether single or multiple, it can confidently be asserted that the major portions of all the worms present will be expelled, provided the recommended total dose of an active male fern extract has been administered and not vomited.

7. After administration of liquid extract of male fern the worms harboured by some patients cannot be expelled by purgatives, although they cease to live and are apparently digested.

8. Patients from whom the head of the worm has not been found should not be retreated unless segments reappear.

9. The immediate treatment is not materially altered by the discovery of the head, and therefore, to save time, a search for it might be omitted.

10. Some clinical evidence is recorded suggesting that ethyl chloride and ether anaesthesia sometimes cure *Tenia saginata* infestation of man.

11. Spontaneous cure may occur, but it is extremely rare.

ACKNOWLEDGEMENTS.

I should like to record my appreciation of the assistance afforded me by Dr. W. J. Penfold in the way of advice and criticism, and by Miss Mary Phillips, B.Sc., in examining the specimens obtained. I also wish to thank Dr. J. P. Major and other members of the Victorian Branch of the British Medical Association who have cooperated in this work.

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SURGICAL TREATMENT OF CARCINOMA OF THE THORACIC ŒSOPHAGUS.¹

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CARCINOMA of the thoracic œsophagus is regarded generally as a hopeless and inevitably fatal condition. There is good reason for such an opinion, since all of us have seen patients suffering from this disease gradually succumb, sometimes rapidly, at other times more slowly. So certain is the outcome that some surgeons postpone the performance of a gastrostomy until the latest possible moment, so that the patient will have the minimum of discomfort during the short time that remains to him. Probably this does not apply to some of the forms of gastrostomy, for example, the Depage or Janeway variety, but nevertheless the view indicates clearly the outlook on the disease. This disease and the œsophagus in general have been referred to as one of the "last frontiers of surgery". It is certainly an area in which reverses greatly outnumber successes.

The situation, however, is not so gloomy as would appear at first sight. There have been a few striking results by surgical treatment. The greatest, that of Torek in 1913, and those of Eggers, Lilienthal and Grey Turner have indicated the practicability of such intervention. Altogether, excluding carcinoma of the cervical portion, many cures of which have been recorded, and also the cardiac region, there have been, by the various methods used, five cases treated successfully by surgery.

Those who have perused the literature of the operative treatment of œsophageal carcinoma will have noticed that in some cases recovery was prevented by some extraneous factor. One can but sympathize heartily with Torek over his patient who refused nourishment after operation when he learned that he had had a cancer. Other similar extraneous complications seemed to be the cause of failures in different cases.

Three years ago I became especially interested in the condition, but quickly came to the conclusion that considerable special anatomical, physiological and pathological knowledge was required. This year, at the Royal Melbourne Hospital, we have had two cases in which œsophagectomy has been performed successfully. The first case has been described in detail in *The British Journal of Surgery* (January, 1936), and the second will be reported shortly. It is these cases which have induced me to draw attention to the treatment of œsophageal carcinoma.

Incidence of Carcinoma of the Œsophagus.

The subject of treatment of this condition is an important one, since carcinoma of the œsophagus is one of the common cancers. From *post mortem* examinations Kaufmann states that it is fourth among carcinomata arranged according to the frequency of their occurrence. Carcinoma of the œsophagus was sixth in order of frequency among 489 carcinomata found to have caused death in 3,600 consecutive *post mortem* examinations personally conducted by Dr. R. Wright Smith at the Royal Melbourne Hospital. The Commonwealth Statistician's figures for deaths from cancer also show the high incidence of œsophageal cancer.

Operability of Carcinoma of the Œsophagus.

Twenty-five cases were seen by me personally during the last year (1935) and yet only two proved to be operable. Of these, nineteen were recognized as being beyond the possibility of interference, one patient had an exploratory thoracotomy (from which he recovered without serious complications), three patients had an œsophagectomy performed (in retrospect, inadvisedly, since the growths were too adherent to be adequately removed), but died some little time after operation. In two instances œsophagectomy was performed satisfactorily; both patients are doing very well.

In all the cases but little time was spent in proving the nature of the disease, so that in the vast majority the condition was inoperable when the patient was first seen. Some of the patients had been observed or treated elsewhere, but a number came to the out-patient department in an almost moribund condition without having sought attention previously.

A certain number of patients therefore, like many sufferers from gastric and bowel tumours, are quite beyond aid when first seen. Probably this state of affairs will remain for many a day, so that it is essential for us to concentrate on the more favourable forms. Unless the cases can be diagnosed at an early stage, operation will be possible for only an extremely few very slowly growing tumours.

Diagnosis.

Diagnosis at the earliest possible stage therefore becomes a matter of paramount importance.

Clinical Diagnosis.—The most important symptom is, of course, dysphagia. It cannot be over-emphasized, however, that dysphagia is a late symptom. The tumour has been growing sufficiently long to cause obstruction to the lumen.

The early symptoms are mild intermittent obstruction which clears up completely, vague sub-sternal discomfort associated with taking of food, and a girdle pain in the thorax, again possibly associated with eating. The oppression or pain beneath the sternum is probably comparable with colicky pain which occurs in intestinal obstruction. The intermittent obstruction may be a "sticking" of solid food at some particular place, and this may be overcome by the patient washing the material

¹ Read at a meeting of the Victorian Branch of the British Medical Association on February 5, 1936.

down with a little fluid. As time goes on this symptom becomes more obvious until actual obstruction occurs and no solid food at all can be taken.

In a number of cases such premonitory symptoms appear to be quite absent. Even if the patient does not volunteer a statement of the presence of these symptoms at an early stage, careful inquiry will show that they have been present, though they have often been disregarded or overlooked. This indicates the necessity of taking serious note of them when they are complained of by the patient.

All of these symptoms may be due to œsophagitis (other than that occurring with a carcinoma), but if they persist for more than a fortnight they should be regarded as significant and the case should be investigated further. Although, of course, such symptoms are most significant in older people, they should not be disregarded entirely in younger patients, since carcinoma is observed every now and again in those well under forty years and even in the early twenties.

Although we may be watchful for the premonitory symptoms, still dysphagia will be the one that most frequently attracts attention. The most important point, in my opinion, is that a patient over the age of forty years who has been gradually developing dysphagia should be proved forthwith not to have a carcinoma. In other words, any such dysphagia is due to carcinoma until proved otherwise; and this happens but very seldom.

X Ray Diagnosis.—X ray examination is an invaluable means of confirming the diagnosis. It is most important, however, that the radiologist should be informed that a carcinoma is suspected, because it is easy to overlook a lesion if only a routine examination be made. I have had a negative X ray report on a patient examined six weeks before death, in whom at *post mortem* examination a large ulcer, five centimetres (two inches) in diameter (the growth having invaded the bronchus), was found. Of course, if ulceration of a growth keeps pace with fungation, then obstruction, which can be observed easily, may not occur. A delay may be demonstrable in these cases nevertheless by special methods of examination. It follows therefore that the importance of X ray findings depends on their positive nature. In a case of dysphagia I always disregard a negative X ray report and proceed with œsophagoscopy.

Œsophagoscopy.—Œsophagoscopy is the surest way of completing the diagnosis, but its dangers must be carefully considered. Hæmorrhage, mediastinitis and pneumonia are all awaiting the patient of the unskilled or unwary. Bronchoscopy should always be performed when the growth is at or above the level of the sixth thoracic vertebra. Discovery of bronchial or tracheal invasion (which is lamentably common) saves much futile and unnecessary effort.

Although to the experienced observer the appearance of a carcinoma is usually sufficiently characteristic for a diagnosis to be made, a piece of tissue

should be removed for microscopic examination. Here again a negative report should not be given a greater valuation than it deserves. It is easy to remove a piece of tissue from beyond the periphery of the tumour and so to gain no indication of the true nature of the lesion. In one of the cases in which œsophagectomy was performed the microscopic report was "inflammatory tissue", but as the other characters were typical, this was disregarded and a carcinoma was found. It is possible rarely for a non-malignant condition to mimic closely a carcinoma, so that a positive microscopic finding is comforting, but a negative report must not be regarded as more important than the combined evidence obtained by the other observations.

Other Methods of Examination.—The Wassermann test, ordinary X ray examination of the chest, blood examination *et cetera* should always be undertaken and the possibility of the association of carcinoma with other conditions, such as syphilis, must be remembered.

It will be apparent, therefore, that too much emphasis must not be placed on any one method of examination, but that all features of the case should be considered together. In my own experience the most important feature is that the patient has dysphagia and this becomes the more imperative when the patient is in the cancer age.

Methods of Treatment.

The results of treatment by X rays and radium, at the Royal Melbourne Hospital as well as in recent reports in the literature, have been so unsatisfactory that I have directed my attention almost entirely to the consideration of operative removal of the growth.

Of the various methods, Torek's technique appears to me to offer the best chance of dealing adequately with the condition. In this method there is a good exposure with a minimum of blind dissection, an adequate amount of œsophagus may be removed, and the condition of the mediastinum and the left lung (it is the left bronchus which is most commonly involved) can be determined.

The actual method employed in the cases mentioned above was, with a few modifications, that described by Eggers as being used at the Lennox Hill Hospital, New York. Approach is made by an intercostal incision along the seventh intercostal (in one case the sixth) space, and greater exposure is obtained by cutting the vertebral ends of the seventh to fourth ribs. A wide exposure of the left pleural cavity and mediastinum may be gained. The œsophagus is then dissected out of the mediastinum. It is cut across at the lower end, the lower portion being inverted into the stomach and the main portion being freed completely by bringing it round the arch of the aorta. An incision is made in the neck and a communication is made between the neck and the upper part of the mediastinum. The œsophagus is then brought through the neck incision, where it is sutured to the fascia and skin at the site of emergence and the redundant part (containing the tumour) is amputated. The chest

is then closed and the lung is allowed to expand, the anaesthetist using slight positive pressure, just as the last sutures are being inserted.¹

The chief difficulties and dangers of the operation are operative shock, inadequate post-operative expansion of the left lung, either with or without pleural effusion, and the development of mediastinitis or pneumonia. We have attempted to overcome the first of these by dividing the operation into two stages: (i) cutting the ribs, intercostal vessels and nerves, and (ii) the actual oesophagectomy. A preliminary pneumothorax also diminishes the amount of disturbance, since it eliminates that due to sudden collapse of the lung.

Although Torek, in his original case, did not drain the chest, Eggers has shown that drainage of the pleural cavity is essential. We have used a special apparatus by which the actual negative pressure in the chamber (and hence in the pleural cavity), as well as the amount of fluid escaping, is measured. This apparatus was demonstrated in the museum at the 103rd annual meeting of the British Medical Association held in Melbourne in September, 1935.

Infection appears to be partly obviated (drainage of the pleural cavity is important) by the use of a protective sheath over the cut end of the oesophagus. Of course, in all other ways (the adequate masking of surgeon, assistants *et cetera*, care in avoiding defects and delinquencies in asepsis) special attention must be paid to the avoidance of infection. Mediastinitis is so serious and fatal a complication that care, even greater than that shown at other operations, must be taken. Regarding pneumonia, although an intratracheal tube was used in Torek's case and in our first case, we have found that, as Eggers has pointed out already, an ordinary well-fitting gas mask gives adequate expansion of the right lung, even if the right pleura is incised.

Determination of Operability.

From what has been said already, it is apparent that but few patients are suitable for operative interference. They must be considered from the point of view of both the general and local condition.

The General Condition.—Many of the patients present themselves in a moribund, decrepit or very poor general condition. These will not withstand even minor procedures, to say nothing of major operations.

Some tumours occur in advanced age. There is no definite age limit. The criterion that we adopt is the probable normal length of life of the individual, as estimated by a consideration of the longevity of the patient's parents. Thus a patient of about fifty-five years whose parents both died before the age of sixty-five is not so suitable for operation as the patient of sixty-two or sixty-three whose parents both lived to be over eighty years. Torek's patient was operated on at the age of

sixty-seven and died at the age of eighty. Of course, the cause of death of the parents has to be taken into account, as well as other factors, such as the patient's mode of life *et cetera*. In general, unless the patient, if he recovers from the operation, will live a number of years (say ten), then the risk of the procedure does not appear to be justified.

Careful examination of the cardio-vascular system, of the blood, of the lungs and of the renal function must be made in determining operability.

The Local Condition.—Since so few tumours have been observed at operation, information on this side is still scanty. Pre-operative information can be obtained only by X ray examination. From our few observations it would appear that extensive growths, those with abnormalities of alignment of the oesophagus (as indicating gross peri-oesophageal involvement) and those with marked ulceration, as shown by well marked niches, are inoperable. This problem will be discussed again at another time.

Oesophagoplasty.

Two diametrically opposed opinions are held concerning the formation of a new oesophagus. Certain surgeons state very definitely that, the tumour having been removed, the patient should not be subjected to further and unnecessary operations. On the other hand, many people regard the result as not having been worth the effort unless the patient is able to swallow normally again.

There is no doubt that an oesophagoplasty is a difficult, time-consuming procedure, usually requiring a number of operations. I would consider that the most important factor to be taken into consideration is the attitude of the patient himself. In the case of the two patients mentioned above, both expressed a desire to have the operations performed, and these are being undertaken.

Summary.

The results obtained during the last year have encouraged us to think that a surgical technique which will enable us to deal with the suitable cases of carcinoma of the oesophagus has almost been achieved.

Among twenty-five cases there have been two recoveries, that is, 8%.

Of six patients operated on, three have recovered from operation, an operative mortality of 50%. Of the three patients who died, two would not, with our present information, have been operated on at all. The third patient was in a "doubtful" class, and if a comparable case were seen again, it would have to be investigated, though probably only a thoracotomy would be performed. We cannot expect to obtain such satisfactory results in all operable cases; but that these have been obtained suggests that we should make a more determined effort to alleviate the sufferings of patients who have developed this most distressing malady.

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¹ Minor variations on the above procedure are being tried, but these need not be discussed here.

Reports of Cases.

AN UNUSUAL NEOPLASM OF THE BOWEL ARISING IN THE VERMIFORM APPENDIX.

By W. L. CORLIS, M.B., B.S. (Sydney),
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THE patient, a woman of sixty years, presented herself with the following history. For six weeks she had been suffering with vertigo and breathlessness. For the previous week she had experienced epigastric discomfort associated with some flatulence, which had no definite relation to her meals. She denied loss of weight both before and following the operation. Some hours before she was seen by me she complained of lower abdominal pain, colicky in nature, with no vomiting; the bowel action was regular. Her weight was 81.9 kilograms (thirteen stone). Her husband died of carcinoma of the colon seven years before.

Examination revealed a well-nourished, rather pale, sallow woman, whose appearance was suggestive of secondary anaemia, and marked dental sepsis was present. Her systolic blood pressure was 210 millimetres and the diastolic pressure was 100 millimetres of mercury. The urine was clear and had a specific gravity of 1.008. Abdominal examination revealed rigidity of the right abdominal muscles with definite tenderness extending all over the right side of the abdomen, with no localization. Rectal examination did not yield any positive information. Her temperature was 37.2° C. (99° F.) and the pulse rate was 96. Immediate operation was advised with a tentative diagnosis of acute obstructive appendicitis.

Operation revealed free, non-smelling, turbid fluid in the peritoneal cavity. The appendix and caecum were immovable and fixed in a hard mass; the appendix itself was grossly increased in dimensions. The meso-appendix was distorted and unrecognizable by infiltration of the growth. The terminal part of the ileum and caecum were also infiltrated. The Peyer's patches of the last 12.5 centimetres of the ileum were enlarged, hard and nodular. The ileo-caecal and other retroperitoneal glands as far medial as the aorta were enlarged, hard and nodular. The appendix and meso-appendiceal growth were removed for biopsy. The bowel proximal to the growth did not show any sign of dilatation or hypertrophy. No evidence of secondary deposits could be felt in the liver. The patient went down hill and died a week following the operation without any symptoms of obstruction. Death appeared to be due to quickly developed asthenia.

The following is the report of the biopsy carried out by Dr. A. H. Tebbutt, of Sydney, who has kindly given permission for it to be published, and who also has gone to the trouble of having microphotographs made of the sections, which are published herewith.

Sections have been cut of the proximal, distal and middle portions of the appendix, and also of the meso-appendix. To the naked eye the appendix was thickened throughout. The lumen was not dilated anywhere, but appeared to be breaking down in places. Microscopic examination reveals an extensive carcinomatous infiltration of the whole of the appendix and also of the meso-appendix. Most of the mucosa and submucosa is replaced by carcinoma cells, and there is infiltration of muscularis, also of the subserous connective tissue. The carcinoma cells are of moderate size and vary in shape, inclined to be polygonal and cubical. There is no acinus formation. It is therefore not an adeno-carcinoma, such as one usually finds in the colon and large bowel generally. It is a diffuse type of carcinoma, such as one finds in the breast.

It would appear from your clinical notes that the colon and tissues about the ileum and ileo-caecal lymph glands are also infiltrated, and the outlook is therefore a grave one. I must say that I cannot remember seeing

a carcinoma of the appendix of this type before. I have seen small, usually benign, carcinoid tumours of the appendix and mucocoeles of the appendix. The adeno-carcinoma of the appendix has been described, but appears to be rare. This particular case does not appear to belong to any one of these three groups. The firm thickening of the whole length of the appendix and the diffuse infiltration are reminiscent of the leather-bottle type of gastric carcinoma.

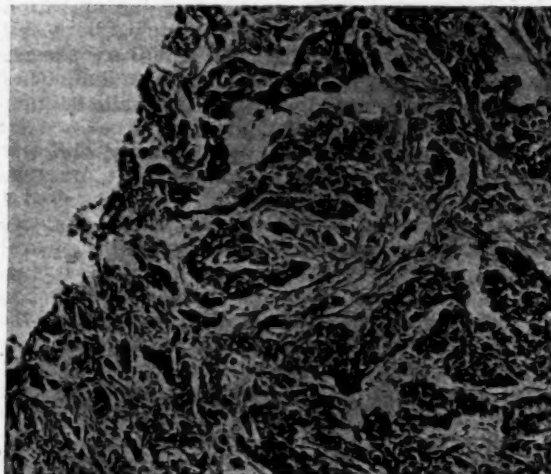


FIGURE I.

Carcinomatous infiltration from the eroded mucous membrane of the appendix. The lumen is seen above. ($\times 100$.)

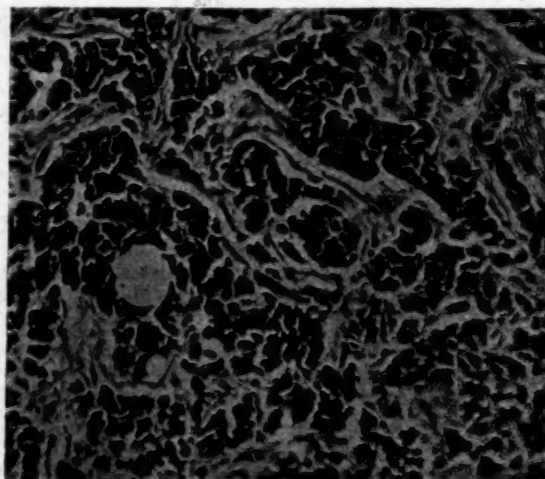


FIGURE II.

Carcinomatous infiltration of the appendix further out. ($\times 210$.)

Comment.

This case is of interest on account of the rarity of carcinoma of the appendix, and more particularly on account of the unusual type of growth appearing in the bowel. Other features were the stated maintenance of weight and also the short history of symptoms, suggesting a rapidity of growth.

CHRONIC RECURRENT DUODENAL ULCER: FAILURE TO IMPROVE WITH HISTIDINE.

By S. SHINERBERG, M.B., Ch.M. (Sydney),
Bingara, New South Wales.

WITH the publication recently of successful results following intramuscular injections of histidine for chronic peptic ulcer, and in particular with the report of a case treated successfully in this manner by Dr. K. J. B. Davis (THE MEDICAL JOURNAL OF AUSTRALIA, February 1, 1936), I think the following case worthy of interest in that no apparent benefit resulted from a course of injections of histidine.

Clinical History.

R.G., aged seventy-two years, a grazier, is a thin, wiry, excitable man, but a non-drinker and a non-smoker. He has a long history of attacks of indigestion over the last twenty years, intermittent in nature and relieved more or less completely by dietetic restrictions and alkalis.

On May 24, 1934, he was admitted to hospital five hours after the onset of violent abdominal pain, collapse and vomiting. Laparotomy one hour later revealed the perforation of an ulcer of the anterior duodenal wall at the junction of its first and second parts. This was closed in the usual way and convalescence was uneventful. The patient left hospital on a strict dietary and alkaline régime, free of symptoms. Remaining well for the most part, he had a severe recurrence of indigestion in June, 1935, when he was admitted to hospital, but strict medical treatment gave only partial relief.

On November 13, 1935, following another acute attack of discomfort, injections of "Larostidin" (Hoffmann-La Roche) were commenced. Five cubic centimetres were given intramuscularly every day for three weeks. Although it was explained to him that no restrictions of diet were necessary, he elected to continue his dietary and alkaline régime. Symptomatically there was some relief during the period in which the injections were given, but symptoms returned one week after the injections ceased.

The occult blood examinations of his stools are of interest and confirm the failure of the histidine to make any impression on the ulcer. Occult blood has been present intermittently over a number of years. On the day on which the injections were commenced occult blood was present. It was still present when tested for on the day on which the injections were discontinued—December 3, 1935. One month later, January 3, 1936, occult blood was still present.

Comment.

Admittedly it is difficult to draw reliable conclusions either of a positive or negative character from one case. This patient is an elderly man, emotional, prone to frequent exhibitions of temper, who thinks, acts, talks and lives at constant high pressure; in other words, he is the typical hypersthenic ulcer-forming individual. It is to be seen, therefore, whether histidine, which has benefited so many cases, will prove to be of value to the unfortunate type presenting, as this patient does, the "ulcer diathesis".

Reviews.

FOR AND AGAINST DOCTORS.

A SMALL book, bearing the title "For and Against Doctors", has been compiled by Dr. Robert Hutchison and Dr. G. M. Wauchop.¹ It is a collection of proverbs,

poems, extracts from plays and essays *et cetera*, all dealing with the deeds and misdeeds of doctors. The quotations are gathered from the works of writers who flourished as long ago as 2500 B.C., and include expressions of opinion by men still living. Naturally, some of the quotations show a malignant hatred for our profession. No doctor will read the following, taken from the Paston Letters, without an uneasy feeling that he must be a blundering knave: "Also for God's sake beware what medicines you take of any physicians of London; I shall never trust to them because of your father and my uncle, whose souls God absolve."

Yet there are other wise sayings which will tend to make us purr with gratified pride. Says Henry Thomas Buckle in his "Miscellaneous and Posthumous Works": "Among the arts, medicine, on account of its eminent utility, must always hold the highest place." So the book goes, page after page of rancour, cynicism and satire, followed by others of which every line breathes commendation and praise.

The book is for the bedside, to be read occasionally and little at a time. It is not to be gulped down like beer; it must be sipped, like good port wine.

The compilers' erudition may be gauged from the fact that in order to prepare the volume they have made use of roughly two hundred writers of every age and clime. The source of the quotation is given in every case, and there is a very complete index.

VITAMINS.

"VITAMINS IN THEORY AND PRACTICE" is an excellent little book which represents the subject matter of four lectures delivered by its author at the Royal Institute, London, in 1934.¹ The book is intended, as the lectures were, to interest the intelligent section of the public. One might therefore be driven to assume that the volume will enjoy only a limited sale; but it is certain to find a ready market amongst students of all kinds. Very few medical men, for that matter, unless they are dietetic specialists, can claim to possess an exact and comprehensive knowledge of what Mr. Harris calls the science of "vitaminics", nor can they fail to benefit professionally and mentally by reading the absorbing story which he has to tell. In a pleasant, colloquial style Mr. Harris has written the whole history of vitamin research, from the times when men knew not vitamins but could cure scurvy, down to our own day, when it is apparent that man must eat vitamin E if he wishes to become a father. Readers other than medical historians will probably be amazed to learn that the condition of night-blindness, due to deficiency of vitamin A, and a not rare affliction in Newfoundland, Labrador, China and elsewhere, was known to Hippocrates, who said that the disease could be cured by a diet of ox liver. "And", adds Mr. Harris approvingly, "he was quite right!" A story bearing upon van Szent-Györgyi's isolation of "hexuronic acid" will bear repetition. When the brilliant Hungarian made his discovery he knew that the substance with which he was dealing must be a sugar of some sort and that its chemical name should therefore end in "ose". But he was totally ignorant of its exact nature and therefore labelled it "ignose". The editor of the scientific journal to which the communication was sent for publication was not a humorist and refused to accept the proposed name. Encouraged by some equally grave colleagues, the editor requested his contributor to supply an alternative title, whereupon von Szent-Györgyi replied: "God-knows."

The book contains many illustrations of the highest interest and importance; and the fact that it is a product of the Cambridge University Press renders unnecessary any comment upon the quality of its paper and type.

¹"For and Against Doctors: An Anthology", compiled by R. Hutchison and G. M. Wauchop; 1935. London: Edward Arnold and Company. Crown 8vo, pp. 165. Price: 7s. 6d. net.

¹"Vitamins in Theory and Practice", by L. J. Harris, Sc.D., D.Sc.; 1935. Cambridge: The University Press; Melbourne: S. Jaboor. Demy 8vo, pp. 259, with illustrations. Price: 8s. 6d. net.

MODERN METHODS OF TREATMENT.

An excellent little manual has been published under the title of "An Introduction to General Therapeutics".¹ The author, H. K. Fry, describes it as a "concise survey of modern methods of treatment", and as such it can be highly recommended not only to students, but to practitioners as well. It provides a veritable fund of knowledge, presented in a readily assimilable form, a method of presentation which is so essential in these days, when time is practically always the essence of the contract.

The various chapters are grouped under rather unusual but nevertheless very practical headings. They make very easy and pleasant reading, which is further facilitated by the paper and the printing.

In discussing the prevention of dental decay the author pins his faith almost entirely on "a non-gritty dentifrice", but omits any mention of the health of the mother during the pregnancy, the gross excess of starchy foods in the average present-day dietary, and a sufficiency of calcium and vitamins A and D as factors concerned with one of the most prevalent troubles of children and young adults seen in practice at the present time.

The author still approves of the intrathecal administration of serum for both tetanus (an animal serum) and poliomyelitis (a human serum), although he certainly qualifies this statement in the following sentence, where it is mentioned that the "intrathecal route is imperative only for meningitis".

He also appears rather unduly optimistic with the observation that alkalization of the urine will alone relieve most cases of urinary infection.

Apart from these few minor criticisms we have nothing but praise to offer for such a comprehensive little volume complete as it is with an appendix showing the composition of everyday foodstuffs and a satisfactory index. Dr. Fry is to be congratulated on supplying such a concentrated meal for any with a "therapeutics" hunger.

MANIPULATIVE MASSAGE.

DR. EDWIN L. HOPEWELL-ASH has written a small book on "Manipulative Methods in the Treatment of Functional Disease".² It is one of a series of semi-popular treatises on nervous disorders, which the author has written during the past twenty-five years.

He states that the material basis of natural cure is to be found in the nerve centres making up both the sympathetic and general nervous systems, and that these fundamental centres of natural self-healing are accessible from the point of view of treatment, both physical and psychological. He combines psychotherapy with reflex manipulative methods, by which he claims to be able to influence these centres in the sympathetic and general nervous system.

He holds that it is possible to influence the various organs by bringing about a change in the sympathetic ganglia through stimulation of the sensitive nerve endings of the posterior spinal nerves. He does this by digital manipulation of the skin, either by light percussion or vibratory massage or rhythmical stroking of the skin. Thus he states that manipulation of the lower cervical area has a steady tonic and general beneficial effect in many cases of disturbed action of the heart, and that the diseases of the digestive organs can be influenced by means of manipulative treatment of the skin of the dorsal spinal area. He insists that the manipulation of the skin

must be very gentle and soothing, and that it should be "a therapeutic caress rather than a kick".

He does not confine himself solely to manipulation of the spinal area, but also manipulates any other part of the skin, for example, the skin of the solar plexus region, also light stroking along the larger nerve trunks, and adds that "rapidly repeated short linear stimulations over McBurney's point will often relieve spasm of the sigmoid flexure and produce normal peristalsis of the caecum and ascending colon", and "such stimulation of the skin area in the neighbourhood of the costal margin of the ninth rib on the left side will produce definite rhythmical contraction of the stomach itself, with corresponding relaxation of the pylorus".

The author also uses direct suggestion during these manipulative measures. He has been practising suggestion for many years, and as the measures he advises in his book are also of a highly suggestive nature, it would be difficult to evaluate the true effects of this manipulative massage.

Although the book describes a method of medical treatment, the whole structure of the book seems to indicate that it has been put up for popular consumption.

HAIR AND SCALP.

DR. AGNES SAVILL'S book, "The Hair and Scalp", is written in a manner which is not only easy but interesting to read.³ In the preface she signifies an endeavour to render the book more useful to the student and busy practitioner. Despite the fact that some aspects of the rarer conditions and more complicated treatments are not dealt with fully, there is much useful and unusual information to be found in the text, making the book one to be desired by the specializing dermatologist as well. The structure and physiology of the hair are adequately dealt with, followed by an interesting discourse on "grey hair". The care of the hair, a subject about which little is usually found in text-books, has been described in a refreshingly lucid manner, followed by an instructive few pages on artificial curling and waving. The inclusion of the chapter on the molecular structure and elastic properties of hair, by W. T. Ashbury, adds considerable interest and understanding to the previous chapter. Common disorders of the hair and diffuse hairfall without disease of the scalp are kept quite separate from those conditions associated with disease of the scalp. In Chapter VIII Dr. Savill shows herself to be a disciple of Sabouraud in her belief that the microbacillus is the main pathogenic organism in *seborrhoea oleosa*, or oily seborrhoeic dermatitis of the scalp.

In addition to local remedies generally, she wisely stresses the part played by the general health and constitutional conditions in disorders of the hair. In the chapter on *psoriasis capitis* she mentions the pityrosporon of the experiments by McLeod and Dowling as being the main pathogenic organism according to their findings.

Numerous other affections and their differential diagnosis are concisely dealt with in ensuing chapters, including diseases of the hair shafts and hair dyes. The concluding chapter on *hirsuties* is well written and very up to date, and the various advantages and disadvantages of the older electrolysis as compared with the newer diathermy method of removal are discussed.

The book contains 280 pages of attractively printed and very readable material, which has been well correlated. There are three pages of formulæ at the end, followed by a comprehensive index. Fifty-four illustrations are presented, mostly of microscopical appearances of different diseases of individual hairs.

¹"An Introduction to General Therapeutics", by H. K. Fry, B.Sc., M.D., D.P.H.; 1935. London: Cassell and Company, Limited. Crown 8vo, pp. 223. Price: 6s. net.

²"Manipulative Methods in the Treatment of Functional Disease", by E. L. Hopewell-Ash, M.D.; 1935. London: John Bale, Sons and Danielsson, Limited. Crown 8vo, pp. 98. Price: 3s. 6d. net.

³"The Hair and Scalp: A Clinical Study (with a Chapter on Hirsuties)", by A. Savill, M.A., M.D., M.R.C.P.I.; 1935. London: Edward Arnold and Company. Demy 8vo, pp. 295, with illustrations. Price: 12s. 6d. net.

The Medical Journal of Australia

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

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CONSTITUTIONAL MEDICINE.

DURING recent years clinicians have in the treatment of disease paid increasing attention to the constitution of the patient. This is not a simple reversion to the point of view of our forefathers, who knew little of infective agents, of bacteriology and of the changes wrought by micro-organisms in the tissues of the body. It is what may be called a renaissance in which new knowledge is being correlated with old. Though the newer outlook began to be manifest early in the century, it received a great impetus during the World War, in which huge masses of men in "vast out-door clinics" were studied, supervised and treated as never before in the history of mankind. The study of genetics, of biological chemistry and the science of endocrinology have also been factors in the reawakening. The present conception of the constitution of man has been described as the summation of inherited traits which are basic in resistance, susceptibility and predisposition to disease. Dr. Robert Hutchison, in his Herbert Maitland Oration delivered last September,¹ gives the term a wider significance. He regards the constitution as the

total make-up of the individual, physical and mental; and he explains that constitution in this sense is partly inborn and so may be inherited, and in part is the effect of environmental influences. Constitution to him is not a static condition; rather is it in a state of flux which varies to some extent from day to day and even from hour to hour.

Dr. Hutchison describes three components in constitution as defined by him: the first is the anatomical or morphological, the second is the physiological or functional, the third embraces the psychological, the intellectual and emotional peculiarities and reactions which the person exhibits. These three components are closely interrelated and react on one another to produce a trinity in unity, the chief integrating factors being the vegetative nervous system and the hormones acting through the blood. Anatomical differences in constitution have been determined, and the two extremes, the asthenic and the pyknic, the lean and lanky and the short and stocky, are well known. Dr. Hutchison thinks that other anatomical divisions may be rather artificial. He also thinks that some of the attempts to give to different morphological types a diathetic significance have been rather far-fetched. He admits, however, that the asthenic type of constitution is found in common experience to predispose to such conditions as pulmonary tuberculosis, to the atonic form of functional dyspepsia and to nervous exhaustion, and that persons of the pyknic type are more subject to asthenic conditions, such as primary hypertension and the hypertonic form of gastric derangement. In referring to functional differences in constitution or the variations in "physiological personality", Dr. Hutchison distinguishes between differences in the working of the machine as a whole: metabolism; and differences in the working of its individual parts: the organs. Unfortunately it is impossible to refer to all the subjects that he mentions in this regard; it is interesting, however, to note that Dr. Hutchison thinks that it is safe to postulate inborn or acquired constitutional differences in the vulnerability of the erythron which may determine liability to some forms of anemia; it is certain also that there are variations

¹ The Journal of the Old Sydney Hospitalers' Club, December, 1935.

in the fragility of the red cells and in the blood coagulability. The ductless glands offer the most important contribution to the individual make-up. There is, Dr. Hutchison thinks, a tendency at present to exaggerate this contribution; and most physiologists will agree with him. "The present-day view of their importance may well be summed up in the statement of Loebel that we have learned to look upon the 'humours' as hormones." Dr. Hutchison made but passing reference to the psychological aspect of the constitution.

What we have called a renaissance in medicine is described by Dr. Hutchison as constitutional medicine; it is also known as neo-Hippocratism and individual medicine. It is based on "tripartite constitutionalism". The definition of a constitution as non-static must be accepted. If the constitution were regarded as static it might be held that it was basic for all branches of medicine; and from these premises it has been argued that medicine becomes a vassal of anthropology. This, however, is not really germane to the present discussion. Medicine has become more and more concerned with the individual; it will surely progress along these lines. "Constitutional medicine teaches us to look for syndromes rather than for cut and dried diseases, its aim being to find out what is wrong with the working of the machine in any of its parts." It also "naturally predisposes us to look for remote causes for local effects". Thought and work along the lines drawn by Dr. Hutchison will undoubtedly yield results. "Such an outlook also enhances the dignity and importance of our art, for by the influence which we are able to exert on constitution, and through it on behaviour, we become one with the great mental and spiritual forces that mould mankind."

Current Comment.

LIPIODOL AS A THERAPEUTIC AGENT.

LIPIODOL is an iodized poppy seed oil, containing in each cubic centimetre 0.54 gramme of pure iodine. It is opaque to X rays and was first used by Sicard of Paris in 1921 as a bland contrast medium for

radiological diagnosis, when injected into the spinal canal, bronchial tree and various cavities or channels of the body. Lipiodol is also employed therapeutically as a method of exhibiting iodine, either by mouth, by intramuscular or by intrabronchial injection. When thus used it probably has no pharmacological advantage over ordinary iodides. Iodism, shown by an acneiform eruption, has followed pulmonary injection. When it is used for the diagnosis of spinal cord lesions, injected lipiodol casts a shadow when a definite block exists in the spinal canal, the lipiodol being arrested at the point of blockage. Such diagnostic use, however, is not without dangers. Grave paralytic symptoms have supervened, and sometimes there have been increase in root pains at the site of the lesion, soreness and stiffness in the muscles of the back, headache and pyrexia. It would appear that pleocytosis of the cerebro-spinal fluid usually occurs, indicating a mild chemical leptomeningitis, but that, in most cases, no further harm results. A. F. Lindblom produced experimentally in rabbits an acute leptomeningitis, which usually subsided in two or three weeks, but in one instance terminated in death. W. Sharpe and C. A. Peterson reported three cases in which lipiodol was used in the diagnosis of spinal disorders. In one an inflammatory reaction resulted at the site of the block, aggravating the symptoms and necessitating operation for the removal of encysted globules of lipiodol surrounded by adhesions. In both the other instances the lipiodol collected in the lowest part of the canal and was still unabsorbed (apparently encysted) fifteen months after injection. It is obvious that such diagnostic injections should not be lightly undertaken.

G. Harrower reports two interesting cases of localized chronic inflammatory spinal meningitis with paresis and loss of control of the rectal and vesical sphincters, in which cisternal injection of lipiodol was used for diagnostic purposes.¹ In both the symptoms were alleviated in a marvellous fashion and cure followed. The first patient was a Chinese woman supposed to be suffering from gonorrhoeal polyarthritis. Later the condition suggested a diagnosis of chronic adhesive meningitis. Diagnostic injection of five cubic centimetres of lipiodol was followed by general symptoms of collapse with profuse sweating and a rapid pulse. On the second day after injection the patient's condition was conspicuously improved. A spastic paresis was transformed into a flaccid paresis and complete control of the rectal and vesical sphincters was regained. The patient, who presented an inert, emaciated picture of misery, became alert and cheerful and weight was regained. A month after the injection the patient could sit up in bed and feed herself. In a further month she walked with crutches. Then no more progress was made, so another injection was given. X ray examination now showed that a constriction previously discovered in the spinal canal had opened up considerably. Progress was

¹ *The Lancet*, September 28, 1935.

now rapid and uninterrupted, and a month later she walked out of hospital, recovered.

The second patient was a Tamil, who fell about twenty feet from a tree. Concussion of the spinal cord was diagnosed. Retention of urine and incontinence of faeces, with weakness of the right leg developed. Lumbar punctures yielded no cerebro-spinal fluid; finally an aspirating syringe withdrew five drops of pus. A month after the accident lipiodol was injected and X ray examination showed the lipiodol scattered in small globules instead of forming a solid mass outlining the spinal theca. Two days after the injection the patient could urinate and soon had complete control of the bladder and rectum. Power returned to the right leg and in twenty-four days the patient walked with crutches. In another week he walked unaided, but with a slight limp.

In Harrower's opinion the good results are due to a chemical inflammation, superimposed on the chronic condition, causing absorption of adhesions, blood clot or pus, with relief of oedema of the nerve roots. Lumbar or cisternal puncture is always followed by a reaction in the cerebro-spinal fluid, but Harrower is convinced that in his cases the lipiodol was the primary factor in producing a return to health. However, he quotes W. M. Craig as saying that lipiodol should not be used in frank inflammatory lesions because of its irritating effect on the meninges. C. Vincent, F. Rappoport and H. Berdet have recently reported remarkable results in traumatic affections of the meninges by the simple injection of air by the lumbar route. In their opinion air dilates the subarachnoid space by mechanical pressure where the canal is narrowed by adhesions. This permits reduction of oedema due to vascular kinking by adhesions and allows the cerebro-spinal fluid and vascular circulation to return to normal. Certainly air injection is not fraught with the dangerous possibilities of lipiodol, although it may provoke a somewhat severe reaction.

THROMBOCYTOPENIC PURPURA.

PURPURA is of course only a symptom; but the variety of purpura in which the blood platelets or thrombocytes are reduced in number is a definite entity, and its treatment rests upon a basis different from that underlying treatment of the other varieties. It is important to know all that is possible about this particular morbid state, because in young persons splenectomy is sometimes performed as a means of relief, and this is a measure not to be undertaken lightly. The most striking finding in this condition is the great fall in the platelet count, but it cannot be assumed offhand that this is necessarily the cause, or at least the only cause. In order to investigate the blood changes, L. M. Tocantins has undertaken some special investigations, and so as to place his work upon an experimental basis he has employed the

method of producing purpura in dogs by the administration of anti-platelet serum.¹ The animals were kept under standard conditions and were trained to lie quietly when under experimental observation without struggle or excitement. Blood was obtained by cardiac puncture, and by fractional centrifugalization a suspension of platelets was prepared free from either red cells or leucocytes. Repeated injection of this material into rabbits produced a serum, with purpurigenic properties, which could be titrated by intradermal injection. Thus the investigator had at his command an experimental purpura which could be exactly controlled and which was associated with a fall in blood platelets. No disturbance was caused in the animals by moderate doses, and the resulting purpura lasted a few days only, but fatal results followed extreme dosage. Haemorrhages occurred in the mucosae and various parts of the skin surface; in some cases epistaxis and bleeding from the alimentary tract occurred, also metrorrhagia and haematuria.

Detailed investigation of the blood changes by the same observer are of some interest.² The bleeding time was estimated, when blood was obtained from an ear vein and from the skin of the abdomen and the thigh; also the coagulation time and the clot retraction were estimated on a unit basis. The usual statistical methods were employed in correlating these data, the standard deviation and the coefficient of variation being calculated. Certain interesting observations were made. The platelet count fell below 50,000 per cubic millimetre within several minutes of an intravenous injection of the anti-platelet serum, and changes in the morphology of the platelets were observed both in the early stages of this fall and during the recovery period. Slight changes were also noted in the red cells and in the leucocytes, but these do not appear to be very significant. The mean bleeding time was definitely increased and the coagulation time at first was diminished and after an unstable period returned to normal. The clot retraction was also interfered with, though a curious point is that the clots became strongly retractile before the platelets had shown any substantial increase. The correlations of these findings with the external manifestations seem to indicate that the closest relations exist between clot retraction and the number of platelets. But in general no really high correlations were found. This conclusion is rather disappointing, but it appears to indicate that the mechanism of haemostasis is very complex and that even in such an apparently uncomplicated state as thrombopenic purpura the explanation is not so simple as might be thought. Tocantins concludes by suggesting that factors other than those under analysis will be found to play important rôles in the mechanism of normal and impaired haemostasis. With these doubts the clinician will perhaps be inclined to agree.

¹ *Archives of Pathology*, January, 1936.

² *Annals of Internal Medicine*, January, 1936.

Abstracts from Current Medical Literature.

RADIOLOGY.

Metallic Scale Indicators for Use in Nailing Fractures of the Neck of the Femur.

ÅKE ÅKERLUND (*Acta Radiologica*, Volume XVI, Number 4, 1935) describes the use of two metallic rod-shaped scale indicators in the treatment of fractures of the neck of the femur by osteosynthesis with the Smith-Petersen pin. The idea is to include in the radiograms a scale of known graduation, placed parallel with the film and at the same distance from the film as the part to be taken or the distance to be measured. Since, therefore, the scale is depicted on the film side by side with the object and similarly magnified, it is possible to mark out and read off on the scale the desired distance. The scale indicators consist of long slender wires of rustless steel with small knobs one centimetre apart and a larger knob marking the centre. After reduction of the fracture the two sterilized indicators are fixed to the skin with adhesive plaster or, better still, by two stitches in order to avoid displacement. One indicator is fixed along the line of the groin and the other along the outside of the thigh in a plane through the great trochanter. In fixing the indicators the operator also tries to apply them so that the prolongation of the axis of the neck would presumably hit the middle knobs of the two indicators. Antero-posterior and lateral films are made with the indicators in position. After reduction has been rendered exact, the vertical projection of the axis of the neck is determined on the antero-posterior picture by simply reading off at which points on the scales the prolongation of the axis of the neck meets the respective indicators. These points are readily found owing to the clearly distinguished larger knobs of orientation on the indicators. The line connecting these two fixed points makes up the vertical projection of the axis of the femoral neck. A small spring fastened to the indicators at the two points concerned helps to render the orientation still easier. Since the lateral scale indicator on the outside of the thigh has been placed horizontally, that is, parallel with the plane of the antero-posterior film, and is at the same distance from this film as the nail will be, the image of this lateral indicator on the antero-posterior film may be used as a scale for measuring the suitable length of the nail. All that is necessary is to measure on the radiogram with a pair of compasses or a strip of paper the distance from the point at which the axis of the neck hits the lateral outline of the shaft of the femur to the point

where the same axis meets the outline of the femoral head, and then to mark out this distance along the lateral scale shadow on the same radiogram and to read off the length of the nail in centimetres.

X Ray Examination of the Intercondyloid Fossa of the Knee Joint.

G. DANIELIUS AND L. F. MILLER (*Radiology*, November, 1935) point out that an X ray film taken in the usual manner does not permit the intercondyloid space of the knee joint to be seen, because the anterior portion of the intercondyloid part of the femur is superimposed upon this space. Many times the spines of the tibia are partly covered by this portion of bone. The intercondyloid fossa can be visualized on an X ray film by a simple technique. As the roof of the intercondyloid fossa is tilted to 60°, the knee joint is flexed to the same angle and a film is placed in the popliteal space. The central ray is directed exactly below the inferior tip of the patella and is perpendicular to the longitudinal axis of the tibia. In a normal case the space appears semicircular in outline, with its edges smooth and regular. The spines of the tibia are always visible, and the articulating surfaces of the tibia and femur are seen as well as, or better than, in the ordinary antero-posterior view. The visualization of calcified crucial ligaments, calcified interligamentary bodies and erosion of the surfaces of the intercondyloid borders of the femur may aid in the differential diagnosis of internal derangement about the knee joint.

"Pied Force" or "Deutschlander's Disease".

A. A. ZEITLIN AND I. N. ODESSKY (*Radiology*, August, 1935) conclude that whether Deutschlander's disease occurs as an acute condition or as a slow process, it is due in all cases to overloading of the foot in individuals whose foot is functionally and anatomically weak. All cases of "forced foot" may be summed up in two groups. In the first are the foot-soldiers, military men, sportsmen, athletes and others who can state exactly the moment when their trouble began; this coincides generally with some unaccustomed overloading of the foot. The second group includes those patients whose profession or trade compels them to be on their feet for prolonged periods. In the slowly developing cases, Deutschlander's disease, radiological changes appear after six to eight weeks. In the acute cases, *Marschfraktur*, they can be detected in three or four weeks. The most important radiological changes are diffuse thickening of the metatarsal diaphysis and fusiform thickening limited to the middle third of the metatarsal. The shadow is of a typical periosteal callus developing around a primary fissure of bone. The

changes in the cortical layer of the metatarsal, which appear as diffuse outlines of the bone at the site of the affection and which seem to extend from the medullary canal to the periphery of the bone, are not found exclusively in Deutschlander's disease. This change can be seen in the process of callus formation in ordinary fractures, and it is a manifestation of the participation of osseous tissue in the process of regeneration and development of a new osteoid tissue around the old bone tissue. In acute overload, fissure of bone predominates in the picture. The authors have observed the fine line of fissure several times in the first few days of the disease before the periosteal thickening occurred. In some cases it was the only sign of the affection. It is necessary to keep in mind the difficulty of determining a fissure radiologically in the absence of dislocation, more or less well marked, of the osseous fragments, and in some cases it is only by examining with a magnifying glass the fine structure of a bone radiogram that it is possible to detect the presence of a fissure.

Examination of the Mucosal Relief as a Diagnostic Aid in Diseases of the Gastro-Intestinal Tract.

G. W. HOLMES AND R. SCHATEKI (*American Journal of Roentgenology*, August, 1935) state that a definite diagnosis of varices of the oesophagus is not possible unless the mucosal relief is demonstrated. Only slight changes from the normal are seen if the complete filling of the oesophagus is used. One may find indentation of the margins of the organ due to varices lying at the edge of the contour line. These changes are not pathognomonic for varicosis, and a diagnosis should not be based on these findings. Very characteristic, however, are the changes seen in the relief picture. The pattern of the mucosa is completely destroyed. Instead of the normal thin rugae, a picture is seen which seems to be quite irregular and which might be caused by a carcinoma. The exact analysis shows that there are tortuous net-like bands of decreased density. They are due to the enlarged vessels which protrude into the lumen and are projected above each other. The radiologist should not be content with this type of relief picture, where all the vessels are lying in a disordered fashion. An attempt should always be made to represent an isolated enlarged vessel to a greater or lesser extent; the result will nearly always be successful if the patient is turned. In nearly all the cases examined the varices were seen immediately above the diaphragm, if varices were present. They extended very often over the whole of the thoracic part of the oesophagus, in contradiction to the commonly held view. The abnormal width of the oesophagus in many cases with varices is striking. This phenomenon

is rather typical of extensive varicosis. The pictures are reminiscent of idiopathic dilatation of the oesophagus. The large diameter of the organ is to be explained by the mass of vessels lying in its lumen. The oesophagus maintains its normal elasticity even in extensive varicosis, in contradistinction to cancer, and changes shape with respiration and with the action of the heart. It is important to look for signs which are caused by the fact that the varices are blood vessels. Two of these attributes which are practically impossible in cancer can be shown. First, the varices can be pressed out by peristalsis, but cancer cannot; secondly, the size of the varices can be changed by changing the intrathoracic pressure; a simple way to do this is to have the patient attempt to take in and to expel the breath with closed glottis.

Bone Changes in Sickle-Cell and Erythroblastic Anæmia.

ANDREW G. GRINNAN (*American Journal of Roentgenology*, September, 1935) states that the bone changes found on X ray examination in sickle-cell anæmia and erythroblastic anæmia are very similar and are not alone diagnostic of either condition. Films of the skull show thickening of certain areas, generally the frontal bone, and vertical striations are usually present. There is thinning of the inner and outer tables, with obliteration of the diploe. The long bones have trabeculations in varying degrees, seen principally in the ends of the diaphyses, and there is widening of the shafts with thinning of the cortex. Pathological fractures may occur and usually unite readily. The metacarpals show widening of the shafts with thickening of the cortex and a fine reticular structure in the medullary cavity.

PHYSICAL THERAPY.

Treatment of Giant-Cell Tumours.

CHARLES F. GESCHICKTER (*The Journal of Bone and Joint Surgery*, July, 1935) states that in the past decade, as the benign nature of these tumours has become a more widespread conviction, treatment has passed from radical surgery to the other extreme of no surgery at all. At present, the prevailing types of treatments are curettage and irradiation. Whether surgery or irradiation will be employed depends largely upon the background of the medical centre and the physician instituting the treatment. From a purely personal standpoint, radiologists are apt to prefer irradiation, and surgeons, surgery. It is the author's belief that a point has been reached at which a middle ground can be taken by the two schools. There are three groups of giant-cell tumours in which irradiation is preferable.

The first comprises the bone cyst on the shaft side of the epiphyseal line, with a short duration of symptoms; this is a so-called giant-cell variant of the bone cyst. Irradiation is usually successful in accelerating healing. In the second group of tumours in which irradiation is preferable, the patients are usually elderly adults, the tumour is seen relatively late, and there is pronounced destruction of bone. If a weight-bearing bone is involved, the probability of restoring the functions of the limb by surgery is doubtful. Irradiation should be tried at first and, if unsuccessful, surgery remains as a second choice. When the giant-cell tumour is located in the spine, particularly in the lumbar or cervical region or in the skull in the region of the temporal fossa, irradiation is preferable to surgery. At such sites recurrence after surgery takes place in over one-third of the cases, and such recurrence is difficult to control and often fatal. For this reason, it is far better to rely upon initial irradiation. Surgery can be used following irradiation if the irradiation is properly given, whereas irradiation following unsuccessful surgery is usually without avail. The possibility of performing a thorough surgical removal of the lesion, without impairment of function, should outweigh all other considerations. In a follow-up of 300 cases treated by various methods the percentage of successful results was highest when resection had been performed.

Evaluation of Hyperpyrexia.

DISRAELI KOBAK (*Archives of Physical Therapy, X-Ray, Radium*, August, 1935) discusses the effect of hyperpyrexia in body tissues, and notes that *Treponema pallidum* has been destroyed consistently *in vitro* with temperatures between 29° and 41.5° C. He chooses the radiotherm as the instrument best suited for raising the temperature. This apparatus is employed on the short wave radiation of thirty metres. The heat created is endogenous in character, and passes through the resistance of the patient in greater uniformity than with diathermy. The desired systemic temperature is reached in about ninety minutes, and the patient is then removed to a bed and the fever is retained by external heat from carbon filament lamps. The author states that the most brilliant results have been obtained in gonococcal pelvic disease. Acute and subacute infections have yielded more readily to this form of treatment, but even patients with the most chronic condition with or without articular involvement, have been restored to normal health. Patients with chronic affections must be submitted to higher temperatures and to a longer series of treatments. A rectal fever level is sustained at 41.1° to 41.6° C. (106° to 107° F.) for from six to eight hours on alternate days. Of thirty-three

patients suffering from urethritis or from urethritis complicated by cervicitis, salpingitis or arthritis, twenty-nine completed the course of treatment; twenty-five were cured; the remaining four were uncured because the required temperature could not be consistently attained. In tertiary syphilitic cases approximately fifty fever-hours are administered each on alternate days of about five hours' duration. In arthritis as many disappointments as encouragements have been encountered. Patients with periarticular fibrositis who show a low sedimentation rate appear to improve more readily.

Röntgen and Radium Therapy in Thyreotoxicosis.

J. THOMPSON STEVENS (*Archives of Physical Therapy, X-Ray, Radium*, May, 1935) bases his remarks on his experience of radiation in the treatment of 360 patients suffering from thyreotoxicosis, 90% of whom are classified as cured; 4% showed improvement, but were not cured. The author states that if a high percentage of cures is desired, toxicity must be present and no patients with non-toxic thyroid conditions, except carcinoma, ought to be submitted to irradiation. The clinical course of the disease following irradiation is given. Occasionally patients with toxic goitre and hyperthyroidism suffer from increased toxicity for a few days following the early treatment. Fortunately this very rarely occurs and is soon followed by relief, and gradual improvement takes place. Nausea, vomiting and diarrhoea, when present, are among the first symptoms to improve or to disappear. Early during the course of active treatment the patient's strength begins to improve and pruritus disappears. Soon the weight increases, while palpitation, tachycardia, tremor, dyspnoea and the tumour decrease and finally disappear. At this time the basal metabolic rate will generally be found to be within normal limits. The eye symptoms are among the last to disappear, and in some cases the exophthalmos never completely vanishes. This is also true in cases treated surgically. In patients who have had severe thyroid intoxication for months or years, myocarditis frequently develops. In these cases the pulse rate is lowered, but may never return to normal, no matter what the method of treatment, whether radiological or surgical. If toxic goitre is superimposed on simple goitre, cystic goitre and other forms, the original tumour remains after treatment, and the enlargement of the gland appearing at the time of development of toxicity disappears. In hyperthyroidism, that is, thyroid intoxication without enlargement of the thyroid gland, superimposed on simple goitre, cystic and other forms, treatment is not followed by any reduction in the size of the primary tumour.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at the Medical Society Hall, East Melbourne, on February 5, 1936, Dr. WALTER SUMMONS, the President, in the chair.

Surgical Treatment of Carcinoma of the Thoracic Oesophagus.

Dr. EDGAR KING read a paper entitled: "Surgical Treatment of Carcinoma of the Thoracic Oesophagus" (see page 399).

Dr. W. G. D. UPJOHN opened the discussion by expressing his unbounded admiration of the remarkable achievement reached by Dr. King. All his colleagues at the Royal Melbourne Hospital were delighted to see his patience and his scientific attention to detail rewarded. It was one of the charms of thoracic surgery that the difficulties challenged one to overcome them. It must be a matter of tremendous pride to Dr. King's fellow members of the Victorian Branch that they were able to enjoy the reflected glory of his remarkable achievements. Dr. King's modest manner of presenting his address had seemed to minimize his remarkable efforts and so Dr. Upjohn intended to enlarge upon some of the difficulties that Dr. King had overcome. In all thoracic surgery there were on the one hand the difficulties and dangers associated with the exposure of the field of operation and, on the other hand, the dangers of sepsis. A long series of efforts by surgeons and anatomists had contributed to the establishment of a method of approach to a carcinoma of the thoracic oesophagus. The exposure had to be sufficiently large to allow hæmorrhage to be controlled and to enable the important structures to be identified, but it should not be over-large. It had been Dr. King's practice to diminish shock by a division of the ribs as a separate stage in the operation. The actual intercostal incision did not lead to great shock, but there might be much muscle to be cut through, and by doing this and the rib resection as a separate preliminary operation, shock was minimized. Another factor leading up to Dr. King's success was that he had already caused collapse of the lung. If the patient was moderately robust, he could stand pulmonary collapse, but when it had to be done as part of the main operation a very great strain was thrown on the circulation, and the lung of the opposite side was diminished in capacity by the moving over of the mediastinum. But a bigger factor still was the interference with the pumping action of chest movements on the great veins and the atria. This led to imperfect filling of the veins and atria, and therefore to imperfect emptying with a falling off of the pulse. Sucking in and out of air produced a cooling effect which added to the shock, and this, therefore, was another factor to be considered in the troubles and dangers for the patient in the opening of the chest.

With reference to the dangers of sepsis, Dr. Upjohn said that the occurrence of sepsis in these operations was partly out of the control of the surgeon, but was partly bound up with the question of adequate approach. If the surgeon could see well, he would operate more satisfactorily. If he was cramped, he was more likely to do a dirty operation because of inadequate control. As an instance of Dr. King's precautions against sepsis, Dr. Upjohn directed attention to the use of the rubber sheath over the cut end of the oesophagus. The pathological changes in malignant disease of the oesophagus were very like those of carcinoma in the tongue or the jaw. In such conditions, when the patient was edentulous the carcinoma was comparatively clean, but if the mouth was septic the carcinoma ulcerated and became dirty and highly septic. Dr. Upjohn asked Dr. King if he had seen any parallelism between the state of the carcinoma of the gullet and the state of the mouth. He knew that

one of Dr. King's patients, an old lady, was edentulous, with a clean mouth, and the carcinoma was not of the fungating type, and he had been struck in his own inoperable carcinoma patients with this parallelism. He suggested that it might be a factor in the pre-operative preparation that the patient should be rendered edentulous. The oesophagus was never surgically clean, but when the oesophagus was dirty it was very dirty, and the surgeon had great difficulty in maintaining cleanliness when operating on it. Anatomical difficulties rendered the risk of sepsis great in this operation. The surgeon had to make an incision through the pleura and then through the pleura again and on into the mediastinum. Under the pleura was one of the richest lymphatic plexuses in the body, and its infection meant the occurrence of an enormous lymphangitis. That was why a patient died so quickly if the pleura became infected. In the other area, the mediastinum, was a great amount of loose cellular tissue which lent itself to an extremely rapid spread of sepsis.

Dr. King had proceeded straight to a discussion of the attack on the oesophagus and had not discussed the planning of the gastrostomy and super-alimentation prior to oesophagectomy. Usually when they came into the surgeon's hands these patients were starved and dehydrated, and it was necessary to insist that they be fed on a high caloric diet to make up for the effects of chronic starvation and long-continued defective intake of fluids. All this patient work was essential to obtain results like those which had been achieved by Dr. King.

Dr. R. KAYE SCOTT offered his congratulations to Dr. King on the presentation of his work, which represented the fruits of much pathological study and careful experimentation, and which showed a fine regard to the smallest details of surgical and nursing technique.

Dr. Kaye Scott proceeded to discuss the methods by which radium therapy had been attempted in the treatment of carcinoma of the oesophagus. In general, the extent of the pathological process and the presence of vital structures at so great a depth made attempts at obtaining a uniform radiation of the lesion an impossibility. The method of Laborde, who used an oesophageal catheter, containing radium sources, which was suspended opposite to the lesion, failed because either an excessive dose was delivered in the lumen, or an inadequate dose was received by the peripheral regions of the malignant growth. The oesophagoscope had been much used for the insertion of radon seeds into the growth. Seeds were a form of radiation which should not be used on account of the risks of radionecrosis from inadequate screening. Endoscopic methods had always failed to allow accurate implantation of seeds or needles. Steele had approached oesophageal carcinomata both by buccal and transgastric routes. Surgery of access had been much recommended, particularly by Souttar, but in none of the cases that Dr. Kaye Scott had seen come to thoracotomy had interstitial implantation seemed to hold out any chance of success.

As Dr. King was presenting the results of recent operations and was not claiming any "cures", Dr. Kaye Scott thought that the meeting might be interested in work which was being carried out at the Royal Melbourne Hospital with radiotherapy in carcinoma of the oesophagus. This had been based on the so-called Coutard technique for deep X ray therapy of neoplasms of the pharynx and larynx. This technique consisted in a prolonged irradiation, using heavy filtration and daily doses, which caused a degree of reaction on the neck often as extensive as a second degree burn—a reaction which had been designated by the term "epidermolysis". Several ports of entry were used, the beams always converging on the neoplasm.

Mattick had recently produced work to show that an epidermolytic dose was about 65% in excess of the erythema dose. He showed that either an erythema or an epidermolytic reaction could be produced in a single massive dose or by repeated fractionated smaller doses. Tissues recovered from the effects of radiation at a fixed rate, proportional to the wave-length of the radiation, which had a variation of from 4% to 8% per day. If allowance were made for this tissue recovery coefficient,

a cumulative dose made up of suitable fractions would have the same effect on normal tissue as a single massive dose of an equivalent amount.

An epidermolytic reaction produced on a mucous membrane, would destroy the epithelium, but should not be destructive to the connective tissues, or else radionecrosis would follow. The doses required to produce such a reaction had been carefully worked out, as had the doses obtained at depth. At a depth of five centimetres roughly a 70% depth dose was obtained, and at ten centimetres 40%. In the former instance it was relatively easy to build up the cumulative depth dose to the levels required to produce an epidermolytic reaction, and the success of Coutard's treatment in pharyngeal lesions was attributable to this fact, though inadequate realization of all the factors concerned had resulted in the publication of a multiplicity of "Coutard's techniques", so much so that Coutard himself had denied that he "possessed" a technique.

The case of the œsophagus was much more difficult because of the much greater depth at which it was necessary to produce an epidermolytic effect. There were definite limits to the tolerance of a patient for daily doses of X rays, and as roughly only 40% of the dose delivered on the skin was reaching the neoplasm, it was impossible to build up the cumulative depth dose to the required epidermolytic level when using only one dose per day, though it could be reached by giving two smaller doses per day. Increased decrements owing to week-ends without treatments were a serious set-back.

The close proximity of the air passages to the upper part of the œsophagus had to be considered, and it was probably not desirable to produce similar reactions in both œsophagus and bronchi, though this could hardly be avoided if the treatment of the œsophagus were pushed to the required level by external irradiation from several ports of entry.

To avoid these effects the plan had been adopted of giving deep therapy in such doses that the cumulative depth dose in the region of the œsophagus was less than that required to produce an epidermolytic reaction, and of following this with an appropriate amount of radium therapy, delivered from an œsophageal catheter, which would raise the "concentration" of radiation around the lesion to the level required to produce resolution. As the intensity of the radiation field around a radium container fell off very rapidly with small increases of distance, this should have the effect of saving surrounding structures, particularly the main air passages, from serious complications of irradiation. The distribution and doses of radium and X rays required had been worked out by the physicist of the Royal Melbourne Hospital Radiotherapy Clinic, working in association with the physicists of the Commonwealth Radium Laboratory.

Finally, the use of the most efficient filters obtainable—the tin filters of Thoraeus—had done much to reduce possible effects of tissue damage, and in the pharynx and larynx reactions had been produced without more than definite redness of the skin of the neck being caused. During treatment, attention was given to anaemia, dental sepsis *et cetera*, an adequate and suitable diet was given, and liver extract injections were given to counteract possible X ray sickness. The patient was trained to put up with a soft nasal catheter passed into the œsophagus. At first this contained the radium as part of the treatment; later its regular passage was necessary in an attempt to prevent an adhesive œsophagitis following the reaction.

Dr. Athol BLAUBAUM referred to the subject from the oto-rhino-laryngologist's point of view. He said that patients with dysphagia at the Alfred Hospital were referred to him after they had been examined by X rays. This order in the investigation was important, because by skiagraphic methods information of value to the endoscopist could be obtained concerning the level of the lesion and the lateral extent of the growth, and certain types of dysphagia, such as that due to aneurysm, which contraindicated instrumentation, could be recognized. He was glad to say that they had not experienced any trouble at the Alfred Hospital, but they had not yet met a varix

such as the one Dr. King had described, which was the cause of a fatal hæmorrhage. In carcinoma of the œsophagus a certain grade of œsophagitis was always present; it was much worse when teeth were present and the mouth was septic. The œsophagitis was proportional to the mouth sepsis; there was more ulceration and bleeding occurred readily, and there was more odour when mouth sepsis was a concomitant factor. He recognized three types of œsophageal carcinomata. In the proliferative type the lumen filled up and there was associated an infiltration of the wall; it was not safe to attempt to pass this type with the instrument. Another type was the ulcerative type with everted edges and undercut walls; and in the third type the infiltration was to a great extent submucous. It was easy to take a specimen for examination in the proliferative type, but not in the ulcerative type; in the latter it was important that the specimen should be taken from inside the everted edge to avoid getting misleading reports from the pathologist. It was most dangerous to take a specimen in the third type, in which the hard thickened wall was under the mucosa; one should wait until the surface was eroded.

Dr. Blaubaum then referred to two accidents after attempts at the application of radium through the tube, with fatal hæmorrhages two or three weeks later. Souttar's intubating tube merely canalized the tumour, and its use could be only palliative and not curative. Dr. Blaubaum considered that the patients must be made edentulous, and then the œdema disappeared and the œsophagitis settled down. Early gastrostomy and removal of all the teeth should be regarded as essential preliminary measures. It was good to know that surgery was now successful, and early diagnosis and preparation for operation should be the great objectives.

Dr. REGINALD HOWDEN said that for these thoracic operations an anæsthetic should be selected that would give the least amount of shock. He used gas and oxygen in small amounts and had to be prepared to use positive pressure at any time during the operation. Premedication with "Avertin" (0.1 cubic centimetre per kilogram of body weight) had been used in Dr. King's operations, with one exception, when "Sodium evipan" was used for some plastic work. At the end of the operations, when the cut œsophagus was pulled out, the patients became very severely shocked. He commenced the general anæsthesia by the intratracheal route and later used the intranasal method, and ended by administering the anæsthetic through the face mask only.

Dr. G. C. SCANTLEBURY, with reference to the endoscopy, said that it was their duty to help a patient suffering from carcinoma of the œsophagus, whether the condition was operable or not. Bronchoscopy as well as œsophagoscopy was often required, and bronchoscopy might show that ulceration into the respiratory passages had already taken place.

Dr. A. E. COATES offered his sincere congratulations to Dr. King for the accomplishment of an epoch-making piece of work, which had required both inspiration and perspiration. Dr. King had won through after many early disappointments, and must be regarded as a pioneer in a new branch of surgery.

Dr. WALTER SUMMONS expressed official concurrence with the praise that Dr. King's splendid work had elicited, and invited Dr. King to close the discussion.

Dr. King, referring to the comments of Dr. Upjohn and Dr. Athol Blaubaum on the influence of sepsis in the oral cavity, stated that he agreed with them and that he always made a great effort to get the mouth as clean as possible in the time at his disposal. In reply to Dr. Kaye Scott, Dr. King thought that there was quite a good field for radiotherapy in this condition when more progress was made in technique, and with careful selection of patients. Dr. Howden had said that the shock had been great at the last part of the operation; a tumour that was operable in the lower mediastinum was inoperable in the upper mediastinum, because the great nerves were more likely to be damaged. He agreed with Dr. Scantlebury about the value of bronchoscopy, and regretted that he

had omitted reference to it earlier. A growth above the level of the sixth thoracic vertebral body was one in which it was extremely valuable to have the bronchoscopic as well as the œsophagoscopic report. In conclusion, he wished to thank the speakers for their generous commendation. He felt that the method of preliminary experimental work to establish each fresh step and the application of the principles of surgery to the problems as they arose had led to his success, which he attributed to Dr. Fay Maclure, who had taught him these principles and inspired his work.

MEDICO-POLITICAL.

A SPECIAL MEETING of the Victorian Branch of the British Medical Association was held at the Medical Society Hall, East Melbourne, on January 23, 1936, Dr. WALTER SUMMONS, the President, in the chair.

National Insurance in Great Britain.

Dr. Summons said that the meeting had been called to give members the opportunity of meeting Dr. G. F. McCLEARY, formerly Principal Medical Officer of the National Health Insurance Commission and Deputy Senior Medical Officer at the Ministry of Health of Great Britain.

Dr. Summons invited members to engage in a discussion with Dr. McCleary by means of question and answer on any of the aspects of interest in connexion with the principles and details of the operation of the scheme in Great Britain.

Dr. McCleary explained that he was passing through Melbourne on a pleasure trip and had accepted the invitation to attend the meeting because he felt that he was able to give at first hand a certain amount of information on this important subject; but it should be understood that he was not a propagandist, nor had he the slightest intention to offer any advice on the solution of any of the medico-political problems which might be facing the members of the profession in Australia, as he had not studied the situation in Australia and was not even aware of the existing conditions of medical practice. He had been prevented by the exigencies of professional work from visiting Australia, which he had contemplated as long ago as 1878, when he had been inspired by the doings of the members of the first Australian Eleven to see the home country of such heroes as Spofforth, Murdoch, Blackham, and C. and A. Bannerman. In July, 1912, he had been appointed Principal Medical Officer of the National Health Insurance Commission, which was the government department to administer the scheme, and when, in 1919, the Commission had become part of the Ministry of Health, he had continued to do the same kind of work until, on reaching the age of sixty-five years, he had retired three years ago, after twenty years of experience of the scheme.

Dr. McCleary prefaced a short *résumé* of the history of the scheme by stating that the British Medical Association had by no means been taken by surprise in 1911. The intention of the Government was made quite clear in Mr. Lloyd George's budget speech in 1909 and had been referred to in *The British Medical Journal* at that time. The Association had collected a lot of information, and the probability of the initiation of the scheme had been in the minds of those who, with Sir Victor Horsley, had done so much reorganization of the Association in the early years of the century. A report on the conditions of contract practice, which was made in 1905 and published in *The British Medical Journal*, might still be read with profit, especially to those engaged in general practice. It was recognized with certainty that some form of contract practice was necessary for the poorer classes in the community. The class which could afford to pay adequate fees for private treatment and the class, composed of the destitute and indigent, who could not pay anything, but for whom the Poor Law Medical Service was established, did not need contract practice; but the intermediate group was the difficult one, for these people could afford

something for medical care by clubbing together on the basis of contract practice. Conditions were formulated and the British Medical Association had a policy regarding contract practice. In 1909 the British Medical Association had three great assets: a strong fighting organization, able leaders and a policy. In 1911 the Insurance Bill contained provisions that had been objected to by German doctors for many years. The British Medical Association enunciated six cardinal points: (i) insurance practice must be as much like private practice as possible; (ii) it was not to be confined to certain chosen doctors, but all registered practitioners of medicine could engage in it if they so wished; (iii) administration of the medical service and medical benefits was to be separated from the insurance administration and distribution of sick pay; (iv) the insured person was to have free choice of doctor; (v) the method of remuneration was to be selected by the doctors concerned in each area; (vi) a statutory local medical committee was to be appointed in each area. The Government granted all these conditions and they were embodied in the Act. Since then all the modifications of the Act had been in the direction of increasing the responsibilities of the medical profession. The Insurance Acts Committee of the British Medical Association was recognized by the Government as the appropriate body to consult in all such matters affecting the profession.

Dr. WALTER SUMMONS asked Dr. McCleary why it was that in England the insured person only, and not the insured person "with dependants", was entitled to the benefits. Dr. Summons felt that in Australia it was likely that there would be a demand for the inclusion of the dependants.

In reply Dr. McCleary said that it had proved to be one of the defects of the English scheme that no provision was made for the dependants. The insured persons were all manual labourers for wages and non-manual workers who received salaries under £250 *per annum*. The insured persons were about 40% of the population of Great Britain. Another grave defect was that no provision was made for specialist attention. A scheme had been prepared to include specialist attention at the time the War commenced and the money was actually voted for this extension of the scheme, but it had been required for more urgent purposes and had not been brought forward since. (This matter was at present under consideration.) Dr. McCleary went on to say that the capitation fee amounted to nine shillings per head per year per insured person, and that in some households there might be two or three or even more such insured persons. If they were not eligible for insurance, an insured person had to make arrangements for the treatment of his wife and family at private fees. For instance, confinements were specifically excluded from the benefits of the scheme. The German scheme had affected only 10% of the population when it came into operation in 1884, but it had been altered to include dependants. With the World War and the economic depression affecting it so soon after its inception, it was only fair to say of the English scheme that "it went in to bat on a wet wicket". The dependants were excluded to cut down the outlay. Their inclusion would cost several millions a year in increased contributions or would necessitate getting more money from the taxpayer, and both these solutions would be very unpopular. The Royal Commission Report of 1926 included an opinion that specialist treatment should precede provision for dependants.

Dr. J. NEWMAN MORRIS asked Dr. McCleary to describe the range of service that was covered by the insurance scheme. He knew that the practitioner was called upon to do everything for an insured person that could be expected of a qualified practitioner of ordinary skill and competence, but he would like an amplification of this definition and would like to know what additional duties had been added since the original bill was framed.

In reply, Dr. McCleary said that the range of service embraced ordinary general practice and that the definition under which it operated was that of Sir Henry Brackenbury. In doubtful cases a mutual arrangement

was made between doctor and patient for charges, but in every case in which a doctor proposed to charge an insured person a fee for services rendered or about to be rendered to an insured person a form had to be filled in and was sent to the Local Insurance Committee, which acted on the advice of the Local Medical Committee, and a decision was arrived at as to whether the proposed fee was for a service which could not be performed by a general practitioner of ordinary skill and competence and whether the practitioner who proposed to do the work possessed the special skill required. Certain criteria were applied: had he had special opportunities in hospital or in post-graduate study, or was he regarded by his fellows as having studied the specialty in question, or did they themselves call him in consultation in such matters *et cetera*. If a dispute on a case occurred between the two local committees, the matter was referred for decision by the Ministry of Health to referees, and in this way case law had been built up. The Ministry of Health ultimately got all the cards and could interfere if it appeared that an anomalous charge had been passed for payment by the local bodies. One enterprising practitioner had claimed that the taking of blood for the Wassermann test was a specialist service. This was, of course, an unmerited slur on the profession, because if it were allowed to pass it would mean that the authorities thought that such a service was beyond the ordinary skill of an average practitioner. The range of service varied also in different areas to a certain extent, though there were guiding principles. Dr. McCleary mentioned two special points that were often the subject of inquiry. In one case, in 1932, he recalled that the injection of varicose veins had been ruled to be within the contract and the giving of anaesthetics, unless of a special nature, was considered to be within the contract. Other instances of duties within the contract were tapping of hydrocele, amputation of a big toe, removal of a small facial sebaceous cyst, fracture of both bones of the leg, removal of a fibro-adenoma of the breast, and reduction of a dislocation of the elbow.

Dr. D. ROSEBY asked whether, such rulings having been given, these things were actually done for the insured persons free of charge, as within the contract, or were the patients referred to the hospitals for the treatment.

Dr. McCleary stated that if the general practitioner could not, or would not, do it himself, he had to provide someone else to do it for him. Certainly the hospitals were not keen to do it for him, and always referred insured persons who applied for treatment back to the panel doctor. It was an offence to charge a fee without submitting a claim, and fines and other penalties were imposed. It was inevitable that in a service comprising 16,000 doctors there should be some who were incompetent.

A member asked whether insured persons were subjected to medical examination before they were taken on to a doctor's list.

Dr. McCleary stated that they were not examined. They joined a society which was glad to get as many members as possible, and some doctor on the panel had to take them on. On rare occasions people could become deposit contributors without joining a society. Disagreeable and unsatisfactory individuals could be refused by an individual doctor, but the doctors had to see that every insured person had a doctor. They were shared out and passed on from one to another. Under the scheme doctors worked together much better than they had previously worked and had a lot of collective responsibility. A subject of acute phthisis might be accepted for treatment by the local tuberculosis officer and sent into an institution, and later might attend a tuberculosis dispensary. There were many more troublesome people than those with chronic diseases.

Dr. A. E. COATES said that he understood that remuneration consisted of a capitation fee of nine shillings per insured person, and asked Dr. McCleary what local control the doctors had over the collection of the money.

Dr. McCleary stated that the method of remuneration was regarded as very important. The area covered by

the scheme was divided into 146 areas, one for each county and borough, and in all but two areas remuneration was on the capitation basis. Thus payment was for responsibility assumed rather than for work done. In Manchester and in Salford, however, the attendance method was chosen by the local medical committee. It involved a lot of book-keeping, with records of visits at the homes and at the surgery separated, and the names, with dates of attendances and the addresses, had to be submitted to the Panel Committee and the accounts had to be examined. It was found that some practitioners attended far too often, entitling themselves to too large a share of the money available for distribution in the area, so an average was struck as to what comprised a reasonable number of attendances for the various types of illnesses. As these averages included the excessive attendances, the average was decreed to be too high, and they now calculated "bogey" and the performance of the "scratch" practitioner and made certain allowances. Dr. Stanley Hodgson was the chairman of the Panel Committee at Salford, and he would not allow any additional attendances for "bunkers", though this allowance was made at Manchester. Both these areas, having given an extended trial to the attendance system, had now, without any pressure from the Government, gone over to the capitation system. No specific sum of money has been mentioned in an Act of Parliament as the capitation fee. Originally it was fixed by regulation at 7s., which became 7s. 3d. when the cost of living adjustment was made, and it increased with the cost of living and when war bonuses were added. In 1920 the British Medical Association demanded more, and the Court of Arbitration fixed the fee at 11s. In 1922 the famous Geddes ax fell, and 9s. 6d. was accepted. In 1923 the Government offered 8s. 6d. and the doctors claimed 11s. Sir Henry Brackenbury acted as advocate for the doctors in the Court of Arbitration, and when the Court awarded 9s. the doctors got up a testimonial for Sir Henry Brackenbury. The sum was subjected to a 10% cut later, but as from January 1, 1934, 5% was put back, and later the remaining 5% was restored. Now the doctors were coming along again for more money.

Dr. NOEL BOX asked if with all these variations in the capitation fee there had been any variation in the insurance premiums paid by the insured persons.

Dr. McCleary replied that there had not been any such variation, though the rates of benefit and the income limit had been raised and the purchasing power of the pound had fallen. In reply to a second question, Dr. McCleary stated that an amount of £240,000 was provided annually for payment of mileage. Mileage was a very complicated problem. The Government actuary made an annual provisional estimate of the number of insured persons, and the President of the Institute of Actuaries assured the British Medical Association that the amount granted was equitable. The number of insured persons multiplied by nine shillings represented the Central Practitioners Fund, which was shared out among 146 areas on the advice of the Distribution Committee, whose duty it was to allocate it. The temporary resident complicated the allocation; for example, in Brighton and Blackpool they abounded, and it was necessary to load the sum in such areas in favour of the local practitioners. The local pool was shared out according to the wishes of the local doctors after the expenses of the Local Panel Committee were deducted (say £20 out of £4,000) and fees for anaesthetics and for emergency treatment were paid. The Distribution Committee also apportioned the mileage money. Nothing was paid in respect of the first two miles travelled, in order to exclude urban doctors, but for distances over two miles it was payable by units. Each unit was defined on the basis of the time taken by the doctor to travel one mile on an ordinary good road. When it was necessary to walk or when a stream had to be crossed or the road was bad, each mile was calculated at more than one unit, perhaps even as five or six units. The claims were subjected to close scrutiny, and rural practitioners sent in their claims to the local County Committee. The £240,000 was thought to be equitable. Of this amount £10,000 was devoted to the payment of

special allowances to those who practised in exceptionally remote areas, to help them to live, to attend post-graduate courses and to get holidays and to pay the *locum tenens* fees. Two shillings and threepence a head extra was paid in rural areas where the doctor ran an insurance dispensary and there were no pharmacies.

Dr. H. DOUGLAS STEPHENS asked Dr. McCleary to describe the clinical records that had to be kept, and to express an opinion on their scientific value.

Dr. McCleary passed round a specimen envelope and card, and stated that these comprised the clinical records that were kept compulsorily under the scheme. When filed they obviated the necessity for a card index.

Dr. W. OSTERMEYER asked whether Dr. McCleary could state on statistical grounds how many visits a doctor would have to make on an average for the nine shillings.

Dr. McCleary said that this question had been investigated by the medical staff of the Ministry of Health, acting as referees, in 1923. They found that per thousand insured persons 3,500 attendances were recorded. This entailed twelve attendances per working day, on the assumption that the doctor worked 300 days in the year. Of these, eight attendances would be at the surgery and four would be domiciliary. It was probable now that these figures would be slightly increased. He calculated that for each insured person there would be, say, four attendances in the year, of which three would be at the surgery. At 2s. per visit at the surgery and 3s. 6d. per visit at the home this would account for 9s. 6d. When it was remembered that 3s. 6d. was an average prevailing private fee and that 2s. 6d. was the usual charge for seeing a child at the father's house, and that these fees included the provision of medicine, it would be realized that the remuneration was about the same as would be charged for private patients of the same class. However, it was one thing to charge private patients and quite another thing to collect the fee. Dr. McCleary mentioned the proud title of a book published in America, entitled "How to Become an Eighty Percenter", which contained many bright ideas on the subject of collecting fees, and emphasized the point that in insurance practice each doctor was a "Hundred Percenter" and did not send out any bills. In private practice the same doctor would not get 80% of his fees. A commentary on the position was that it was not unusual to have to request a doctor to pay in his quarterly cheque.

Dr. J. A. CAHILL inquired the amount of the emergency fee and asked what amount was deducted on this account from the insured person's own doctor.

Dr. McCleary said that before an emergency fee was payable it had to be shown clearly that the usual attendant was really not available and also that the service was for a real emergency. These facts were ascertained by the panel committee, the decisions on all such matters being thus thrown on to the local doctors, who were best able to agree mutually and least likely to put up with unjustifiable claims, as they themselves would suffer financially if one of their number was unfairly paid.

Dr. C. H. DICKSON asked whether, if the insured person was involved in an accident and got third party damages, his doctor had to give free service.

Dr. McCleary said that this would be the case if the injury was inside the contract.

Dr. H. BOYD GRAHAM asked Dr. McCleary what amount of rendering of certificates was obligatory and whether this work was burdensome to the doctor or unsatisfactorily performed.

Dr. McCleary handed round a book of certificates which showed how simple and fool-proof the system was, and went on to say that the greatest amount of burdensome work was the prescribing, which was novel to many of the doctors in England and Wales, who were used to a very limited number of very simple mixtures, which were dispensed and distributed at their surgeries and did not involve the formal writing of prescriptions. With reference to the certificates of entitlement to sick pay, there had been a certain amount of discussion as to whether the

doctor in charge of the insured person should fill them in or whether someone should be specially deputed to do it, and it was generally considered that it was sounder for the doctor in charge to do it. In the German system this was insisted on, and so it was in the English system.

Dr. W. OSTERMEYER stated that psycho-neurotics and hypochondriacs comprised about 30% of the patients, and asked Dr. McCleary what was done to see that such people did not receive sick pay unjustifiably.

Dr. McCleary said that the matter was left to the doctor concerned, who could refuse to sign the certificates or could have any patient removed from his list if troublesome in this way.

Dr. GERALD ASHTON asked a series of questions, in answer to which Dr. McCleary said that it was the insurance committee which provided the lists to the doctors. The clinical record was an envelope with a continuation card; when this was received by the doctor the patient was automatically on that doctor's list; no doubt nominal rolls were kept for office purposes, but were not sent out to the doctors. An insured person could transfer from one doctor to another by application, in which he had to give one month's notice. The doctor could get rid of an insured person who was on his list by writing to the secretary of the insurance committee, who would in all probability telephone the secretary of the panel committee, who must arrange that some other doctor would take the person before he was off the original doctor's list.

In reply to Dr. Ashton's inquiry as to whether the doctor must answer a call from an insured person on his list promptly at any time, Dr. McCleary said that the doctor must exercise his discretion much in the same way as he would in private practice, but he had to remember that he was liable to fine for negligent delay. There was an instance of the imposition of a fine of £100 for neglecting to attend promptly to a hernia in an old man who had been under observation in respect of the hernia, but on the occasion of the delay the hernia had become strangulated. This example sufficed to show that, if he did not attend promptly when called, the doctor had to take the risk.

Dr. KENNETH SMITH asked about applications for specialist treatment and payment for such treatment.

Dr. McCleary said that the payment was made by the patient after private treaty with the specialist, but the fee would have to be refunded if the two local committees and/or the referees decided that it was not a special service. Every instance in which a doctor charged a fee to an insured person had to be reported. In 1934 some 1,172 cases had been reported, and in only forty of them had the decision gone against the doctor. With respect to excessive prescribing, Dr. McCleary explained that the costs were recorded and examined periodically by the Ministry of Health. If accused of excessive prescribing, the doctor would be interviewed by his fellows of the panel committee and he might then reform. It would be explained to him that they also were anxious to do the right thing by their patients and were also imbued by a high professional sense in the care of their patients, but they could do it for X, and his treatment was costing X plus Y, and he must explain the Y and see that it vanished in future. The committee was empowered to withhold a certain amount from the erring doctor to pay for the excessive charge, but the doctor could appeal to a tribunal if he wished.

At this stage the President (Dr. Walter Summons) introduced Dr. J. H. L. CUMPTON, and after referring to the fact that Dr. Cumpston, in his official capacity as the chief executive officer of the Commonwealth Health Department, would have a great influence on any national insurance scheme that might be inaugurated in Australia, invited him to address the meeting and to question Dr. McCleary.

Dr. Cumpston expressed very great interest in the subject matter under discussion and his high admiration of the way in which Dr. McCleary had handled it, and

recalled an occasion some thirty-two years earlier when he himself was in London working for the Diploma of Public Health. At that time he was told that there were three outstanding figures whose future careers he should watch. They were Kenlin, Newman and McCleary, and though he had not met Dr. McCleary again until that evening he had always been extremely interested in anything that he had heard or read about him, and held the highest possible regard for his views and utterances. There were certain aspects of national insurance to which he wished specially to refer. He had been definitely opposed to the nationalization of medicine all his life. He would be glad to know what had happened to Section 53 of the Act, which was included to implement the argument stoutly advanced by Mr. Lloyd George, that the National Insurance Scheme was to be a powerful preventive agent, with reduction of the sum total of sickness. It enacted that if the amount of sickness was excessive in a district, that district could be loaded until the amount of sickness was reduced to the average. He asked if the section had become a dead letter. Undue stress must not be placed on the preventive aspect when advocating national insurance.

Dr. Cumpston's next observation was that the overhead expenses of the English scheme must be enormous. Dr. McCleary had mentioned that a general practitioner might be called upon to perform excision of an epithelioma for two shillings; surely this was a burlesque of a fee. If the method of remuneration were altered to an annual salary without the overhead cost of ascertainment and distribution, it should be possible both to reduce the overhead and to benefit the doctors. A bridge would have to be made between surgery and domiciliary treatment for a small fee and the official hospitalization system. He asked who paid for institutionalization, which was a growing part of the machine. He understood that no such bridge was provided. In Australia it would be impossible to limit a national insurance scheme to general practitioner service. The people would demand that hospitals should be included in the system. The ease with which members of parliament could be approached, and the way in which the custom of approaching them had become established in Australia would necessitate the employment of a whole-time staff and political pressure would be continuous and burdensome.

In reply to Dr. Cumpston, Dr. McCleary said that the administrative expenses of the approved societies, the medical committees and the Ministry of Health amounted to approximately 15% of the total cost, and he did not think this excessive when it was remembered that they had to pay out millions of pounds in small weekly claims for sickness. Section 53 was certainly passed with the Act, but was foredoomed to failure. It was not thought that damage to health could be reduced to money; with the possible exception, say, of an epidemic of typhoid fever in a district, it was too difficult to prove before a tribunal that the doctors could be blamed for an increase in sickness in the district. It was true that the section had not worked; indeed, it had not been put into operation.

Dr. McCleary wished it to be understood clearly that he was not suggesting that the English scheme should be applied or would work in Australia. There might not be any need for any scheme; he did not know; he had not studied the question. He was able to state that political influence had not tainted public health work nor insurance work in England; changes in governments had occurred, but those permanent officers responsible for the insurance scheme had not noticed any effect on the administration of the scheme.

DR. J. NEWMAN MORRIS proposed a vote of thanks to Dr. McCleary. In the course of his remarks he stated that Australia was one of the few countries that had not adopted some scheme of social medical insurance. Last year the Canadian Medical Association had advocated the introduction of social insurance. Dr. McCleary had addressed thirty-six meetings in America, where State medicine was very imminent and had been attempted in some States at varying dates since 1916. In Australia a Royal Commission had considered the subject in 1924.

He quoted the comment of Lord Rosebery that a Royal Commission was "a device of a government to shelve a subject"; but went on to say that at present the Commonwealth Government was again making inquiries about the project.

The vote of thanks was put to the meeting by the President and carried with acclamation, and in acknowledging it Dr. McCleary confirmed Dr. Newman Morris's statement about the large number of meetings he had addressed on his tour of America, but stated that the questions he had been asked in Melbourne gave him the impression that here the doctors were much better informed about the English scheme than those in America.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

- Bennett, Ronald Salomon, M.B., B.S., 1933 (Univ. Sydney), Maclean.
 Collins, Edmund, M.B., B.S., 1933 (Univ. Sydney), Braithwaite, Tindale Road, Artarmon.
 Grogan, Gertrude Urquhart, M.B., 1923, Ch.M., 1929 (Univ. Sydney), The Rachel Forster Hospital for Women and Children, 195, George Street, Redfern.
 Brent, Richard Hillier, M.B., B.S., 1933 (Univ. Sydney), 12, Wylde Street, Potts Point.
 Hugh Smith, William Anderson, M.B., B.S., 1933 (Univ. Sydney), University Club, Phillip Street, Sydney.
 Mills, Frank Harland, M.B., B.S., 1933 (Univ. Sydney), Marrickville Hospital, Marrickville.
 Saunders, Corrie, M.B., B.S., 1926 (Univ. Sydney), Sydney Hospital, Sydney.
 Scott-Young, Marjorie, M.B., B.S., 1936 (Univ. Sydney), Sydney Hospital, Sydney.
 Whiddon, Helen Maude, M.B., B.S., 1933 (Univ. Sydney), 124, Wolseley Road, Point Piper.
 White, Mervyn McAuley, M.B., B.S., 1935 (Univ. Sydney), 324, New Canterbury Road, Dulwich Hill.

Correspondence.

AUSTRALIAN TYPHUS.

SIR: Re the article on Australian typhus, by J. C. Hughes and O. A. Diethelm, THE MEDICAL JOURNAL OF AUSTRALIA, March 7, 1936, page 327.

There have been seventy-two such cases admitted to the Adelaide Hospital from 1922 to 1935 inclusive.

F. S. Hone has published a series of papers in THE MEDICAL JOURNAL OF AUSTRALIA, 1922, Volume I, pages 1, 22 and 83; 1923, Volume I, page 435. *Vide* also L. B. Bull, same issue, page 443.

Rosenow's "Preventive Medicine and Hygiene", Sixth Edition, page 295, refers to endemic typhus in Australia; also Hans Zinsser, in "Rats, Lice and History", refers to the occurrence of the disease in our country.

Yours, etc.,

25, Port Road,
 Bowden,
 South Australia,
 March 9, 1936.

J. M. DWYER.

STAWELL MEMORIAL FUND.

THE undermentioned additional subscriptions have been received for the Stawell Memorial Fund:

- £3 3s.: Dr. Felix Meyer.
 £2 2s.: Dr. C. H. Mollison, Dr. George Bell.
 £1 1s.: Dr. A. Jacobs.

NOTICE.

THE New South Wales Post-Graduate Committee in Medicine advises that the lectures which were to have been given in Sydney by Professor Dean Lewis during the month of July, 1936, will not now take place.

Books Received.

- AN INTRODUCTION TO GENERAL THERAPEUTICS, by H. K. Fry, B.Sc., M.D., D.P.H.; 1935. London: Cassell and Company. Crown 8vo, pp. 223. Price: 6s. net.
- A SYNOPSIS OF PHYSIOLOGY, by A. R. Short, B.Sc., M.D., F.R.C.S., and C. I. Ham, M.B., B.Ch., F.R.C.S.E.; Second Edition, edited by C. L. G. Pratt, M.Sc., M.D.; 1936. Bristol: John Wright and Sons Limited. Crown 8vo, pp. 312, with illustrations. Price: 10s. 6d. net.
- ACTION THERAPY TECHNIQUE: AN OUTLINE OF INDICATIONS AND METHODS FOR THE USE OF MODERN LIGHT THERAPY, with foreword by Sir Henry Gauvain, M.D., M.Chir., F.R.C.S.; Third Edition; 1935. Slough: The Sollux Publishing Company. Crown 8vo, pp. 190.
- THE INTEGRATION OF THE ENDOCRINE SYSTEM, by W. Langdon-Brown, M.D., F.R.C.P.; 1935. Cambridge: The University Press. Crown 8vo, pp. 53. Price: 2s. net.
- THOSE WERE GOOD DAYS: REMINISCENCES, by C. L. Schleich, translated by B. Miall; 1935. London: George Allen and Unwin, Limited. Demy 8vo, pp. 280, with plates. Price: 12s. 6d. net.

Diary for the Month.

- MAR. 24.—New South Wales Branch, B.M.A.: Council (quarterly).
- MAR. 25.—Victorian Branch, B.M.A.: Council.
- MAR. 26.—New South Wales Branch, B.M.A.: Annual Meeting.
- MAR. 26.—South Australian Branch, B.M.A.: Branch.
- MAR. 27.—Queensland Branch, B.M.A.: Council.
- MAR. 31.—New South Wales Branch, B.M.A.: Council (Election of Office-Bearers and Appointment of Standing Committees).

Medical Appointments.

Dr. G. G. H. Murdoch has been appointed, pursuant to the provisions of the *Workers' Compensation Act, 1928*, to be Certifying Medical Practitioner at St. Arnaud, Victoria.

Dr. J. Macarthur has been appointed Government Medical Officer at Bombala, New South Wales.

Dr. G. E. Foreman has been appointed, pursuant to the provisions of the *Workers' Compensation Act, 1928*, to be Certifying Medical Practitioner at Caulfield, Victoria.

Dr. C. E. Dolling has been appointed Honorary Clinical Assistant to the Dermatological Section at the Adelaide Hospital, South Australia.

Dr. L. O. Rutherford has been appointed Government Medical Officer at Muswellbrook, New South Wales.

Dr. C. J. M. Walters has been appointed Honorary Surgeon and Surgical Tutor, Prince Henry Hospital, Office of the Director-General of Public Health, New South Wales.

Dr. H. M. Trethowan has been appointed Medical Superintendent of the Perth Hospital, Western Australia.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," pages xvi, xvii, and xix.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmrain United Friendly Societies' Dispensary.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Friendly Society Lodges at Casino. Leichhardt and Peteraham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: HONORARY Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Chillagoe Hospital. Richmond District Hospital, North Queensland. Members accepting LODGE appointment and those desiring to accept appointments to any COUNTRY Hospital, are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

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